A RECLASSIFICATION OF THE ARCTIIDAE AND CTENUCHIDAE FORMERLY PLACED IN THE THYRETID GENUS *AUTOMOLIS* HÜBNER (LEPIDOPTERA)

WITH NOTES ON WARNING COLORATION AND SOUND

BY

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A RECLASSIFICATION OF THE ARCTIIDAE AND CTENUCHIDAE FORMERLY PLACED IN THE THYRETID GENUS *AUTOMOLIS* HÜBNER (LEPIDOPTERA)

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By A. WATSON

CONTENTS

SYNOPSIS

The 168 Neotropical species of Arctiidae and Ctenuchidae hitherto placed in *Automolis* Hübner are redescribed and reassigned to 35 other genera, of which 32 (11 new) are Arctiid and three Ctenuchid. Only the type-species, an African Thyretid, remains in *Automolis*. Four new species are described and 16 species-group names are newly synonymized. Aposematic coloration, sound production, mimicry and male scent-producing organs are discussed.

INTRODUCTION

The primary purpose of this paper is to reclassify the numerous species of Neotropical Arctiinae hitherto placed in the genus *Automolis* Hübner ([1819*b*] : 170), the type-

species of which is an African Thyretid. Travassos (1943), Watson (1971; 1973) and Kiriakoff (1973) have pointed out the incorrect family placement of *Automolis* by earlier authors. The need to clarify the taxonomy of this heterogeneous assemblage of Arctiid and Ctenuchid species has been evident for some time (Seitz, 1921 : 365) and has been restated by Forbes (1939 : 192), Travassos (1943) and Watson (1971; 1973).

Blest (1964) has shown that some of the species discussed in the present work exhibit aposematic coloration and are unpalatable to certain predators. The lack of expected Müllerian concordance in colour–pattern discussed by Blest (1964) is shown here to be an illusory anomaly (see remarks on mimicry).

The ultrasonic sounds produced by many nocturnal Arctiidae and Ctenuchidae have been demonstrated to act as aposematic signals (Dunning, 1968). The external structure and sound production capabilities of the tymbal organs in the genera dealt with in this paper are discussed.

Colour terms used in this paper are taken from Kornerup & Wanscher (1967).

SUPRA-GENERIC CLASSIFICATION

Since Forbes (1923), most authors have grouped together the Arctiidae, Agaristidae, Ctenuchidae, Hypsidae, Noctuidae and Nolidae in one superfamily, the Noctuoidea. Brock (1971) supported Forbes' (1923) additional inclusion in the Noctuoidea of the Notodontidae. Below family level there has been much difference of opinion (Kiriakoff, 1952). Forbes (1939) recognized two subfamilies of Arctiidae: Arctiinae and Lithosiinae, and later (1960 : 15) added the Pericopinae and, tentatively, the Hypsinae. Forbes' (1960) postulation that the Ctenuchidae [his Euchromiidae] are probably not separable at the family level from the Arctiidae, is supported by the fact that tymbal organs (p. 7) commonly occur in both nominal families although they may be vestigial in day-flying species of Ctenuchidae. The adoption of such proposals, however, should await a comparative study of the included genera. A subfamily classification which reflects the degree of similarity of only the type-genera and a few of its allies is not a great improvement on that existing now.

All the genera surveyed in the present work can be placed in the Arctiinae sensu Forbes (1939), the equivalent in Seitz (1918 : 231) of the combined Phaegopterinae, Micrarctiinae, Spilosominae, and Arctiinae. At the tribe level, these genera can be included in the Phaegopterini, as defined by Forbes (1939 : 192), and below tribe level in the *Eupseudosoma*-group of Forbes and Franclemont (1957 : 149).

SPECIES CLASSIFICATION

The type-species of *Automolis* Hübner was designated by Kirby (1892 : 220) as *Sphinx meteus* Stoll ([1781] : 109, pl. 347, fig. B) (type-locality: South Africa, Cape of Good Hope). Zerny (1912 : 44) transferred *meteus* to *Metarctia* Walker, a genus of Thyretidae, apparently as unaware of Kirby's type-species designation

as was Hampson (1901 : 3). The effect of Zerny's action was to synonymize *Metarctia* Walker (1855 : 769) with *Automolis* Hübner [1819*b*], but it remained for Travassos (1943) to reveal this. Hampson's (1901) usage of *Automolis* (for which he incorrectly cited *Sphinx sypilus* Cramer as the type-species) in the Arctiidae was unfortunately followed by numerous authors, including Strand (1919) and Seitz (1921) in a world catalogue and illustrated monograph respectively, so that by 1943 there were some 200 nominal Arctiid species in the genus *Automolis*, none of them allied to its Thyretid type-species except at superfamily level.

Hampson (1901 : 39), basing his conclusions on venational characters subsequently shown to be unreliable (Sotavalta, 1964), placed 13 nominal genera in the synonymy of *Automolis* and associated a startling array of differently patterned and coloured species. He later (1920 : 129) added *Ernassa* Walker and *Echeta* Herrich-Schäffer, by transference of its type-species, to this list of synonyms. (*Caryatis* Hübner, also listed by Hampson (1920), is a Hypsidae name wrongly applied by Hampson as a result of an incorrect type-species designation (Travassos, 1943 : 456).) Forbes (1939 : 192) pointed out that 'a study of the genitalic characters [of *Automolis* species] may produce a grouping more like that suggested by their patterns' and revealed that the few known larvae of *Automolis* are 'varied'. Travassos (1943) re-established ten genera whose names had been relegated to synonymy by Hampson, namely *Apiconema* Butler, *Arara* Walker (replaced by *Lepidokirbyia* Travassos), *Cresera* Schaus, *Echeta* Herrich-Schäffer, *Ernassa* Walker, *Euplesia* Felder, *Machaeraptenus* Schaus, *Rhipha* Walker, *Sutonocrea* Butler and *Scaptius* Walker; he also transferred *Apyre* Walker, *Cratoplastis* Felder and *Ormetica* to the synonymy of *Rhipha* Walker, and *Gorgonidia* to the synonymy of *Cresera* Schaus. Watson (1971) re-established *Cratoplastis*, *Gorgonidia* and *Ormetica*.

In the present paper 11 new genera are erected for 34 of those nominal species of Arctiinae hitherto classified in *Automolis*, and each of the remaining 118 species is transferred to one of 21 presently established Arctiinae genera or to one of three Ctenuchidae genera; only the African type-species remains in *Automolis*. Most of these transferences are probably taxonomically satisfactory; a few (indicated in the text) are provisional placements. These provisionally placed species have been transferred to genera in which they can be associated with their closest apparent relatives, even though their new generic placement is in some instances doubtless incorrect. Pending revisionary work on these genera, it seems better to take this action than to retain these species in *Automolis*, a genus of Thyretidae.

WARNING COLORATION AND MIMICRY

Blest (1964) has commented on the anomalous variation in aposematic coloration and colour-pattern in what he presumed to be closely related species of Arctiidae. Selection pressures produced by diurnal predators could be expected to produce close similarity in the coloration of unpalatable groups of species – a predator having learnt to associate unpalatableness with a particular colour-pattern is likely to respond in the same way to other species exhibiting the same pattern. The resultant Müllerian associations in the Acraeinae, Danainae, Ithomiinae, Heliconiinae and

some Papilionidae (e.g. *Parides*) are well documented (Brower, L. P., 1963; Brower, J. V. Z., 1963; Brower, Brower & Collins, 1963; Turner, 1968). There are, in fact, similar intra- and intergeneric associations in those Arctiidae studied by Blest; the seemingly anomalous situation he found being the result of the taxonomic disorder initiated by Hampson. In this paper the effects of Hampson's 'lumping' are corrected, fairly typical Müllerian associations are revealed and it becomes unnecessary to postulate explanations such as Tinbergen's (1960) theory of specific search images (Blest, 1964).

The aposematic coloration of *Eupseudosoma*-group Arctiidae is not invariably exposed when the moths are at rest, in contrast to the blatantly advertised coloration of some unpalatable butterflies. It seems a reasonable assumption that the almost uniformly brown *Himerarctia griseipennis* Rothschild (p. 40) is a procryptic species when at rest; but when the wings are unfolded the bright yellow (or orange) and iridescent greenish blue aposematic coloration of the abdomen is exposed. Species such as *griseipennis* have apparently evolved a dual defence system involving cryptic coloration as the first line of defence against predators, supplemented by distastefulness (advertised by abdominal coloration) when warning display behaviour has been activated by predators. Blest (1964) has emphasized the fact that many Arctiidae (as in other groups of unpalatable Lepidoptera) have a tough and resilient cuticle which is able to withstand investigatory pecking by birds.

Those *Eupseudosoma*-group species which have brightly coloured forewings, as well as a conspicuous abdomen, potentially have two phases of warning colour signals. *Himerarctia laeta* sp. n., for example, has bright orange forewings which are as conspicuous at rest as in flight, while *Viviennea moma* Schaus and many *Ormetica* Clemens species have black and yellow forewings (a combination of colours generally considered to be aposematic (Frazer & Rothschild, 1960)). All these species have brilliantly coloured abdomens which are exhibited during warning display (see figures in Blest, 1964). White and pale yellow species, which are unlikely to prove to be cryptically coloured in their resting surroundings, may also fall into this category. Blest (1964) demonstrated that two yellow species of *Selenarctia* gen. n., one white species of *Eupseudosoma* and three mostly white species of *Idalus* are unpalatable to *Cebus* monkeys. Each displays its orange or red abdomen during warning display. In these species, the disadvantages of being potentially less successful in concealment are apparently outweighed by the advantages of being able to signal an instant visual aposematic message to a predator possessing the necessary colour-vision. That attempts at diurnal concealment *are* made by most warningly coloured night-flying Arctiinae, seems reasonably certain from my observations in Venezuela and south-west United States, and those of R. E. Dietz in Costa Rica and Venezuela, J. P. Donahue in Costa Rica, E. L. Todd in Jamaica, and F. Fernández Yépez in Venezuela (1973, personal communications), thus tending to qualify the generalization (Remington & Remington, 1957; Rothschild, 1972) that noxious, warningly coloured moths choose exposed positions when at rest during the day.

The possibility that white *Idalus* and *Eupseudosoma* species may prove to have at least a partly crepuscular flight is worth investigating. *Hyphantria cunea* Drury

(the Fall Web-worm) has been shown to start flying before sunset in Japan (Hikada, 1972) at which time its conspicuous whiteness could be aposematic and provide a selectively advantageous warning signal to crepuscular avian predators such as night-hawks which locate their prey visually.

The genera *Viviennea* gen. n., *Ordishia* gen. n., *Ormetica* Clemens and *Idalus* Walker provide some of the best examples of Müllerian partnerships. Blest (1964) has shown that some species of each of these genera are unpalatable to caged vertebrates and produce the same type of warning display. The close similarity in coloration and pattern between the groups of species in *Ormetica*, for example, strongly suggests that these are Müllerian complexes. There may be, however, limited Batesian mimicry within these groups – the presence of a moderately palatable species in a Müllerian complex will tend to induce the evolution of a new colour-pattern by a highly unpalatable member of the complex and lead to the formation of a new complex of species (Pough et al., 1973) and may explain the presence of several differently patterned groups of species in *Ormetica*. Each of the species-groups in *Ormetica* has one especially constant character: the brilliantly iridescent, greenish blue coloration of the posterior segments of the abdomen, a character shared by all the species of *Viviennea* and *Himerarctia* gen. n. There are close intergeneric similarities in the forewing coloration between the *Ormetica*-group *bonora* Schaus, *ochreomarginata* Joicey & Talbot, *luteola* Rothschild, *codasi* Jörgensen, *postradiata* Schaus and *xanthia* Hampson, and the *Viviennea* species *salma* Druce and *superba* Druce. All of these are bright yellow species, with iridescent greenish blue posterior abdominal segments, for which it is tempting to postulate Müllerian affinities. Another example of probable Müllerian convergence is that between the monotypic *Euplesia* Felder and the group of *Ormetica* species including its type-species *sphingiformis* Clemens in which the forewing bears a conspicuous, longitudinal, yellow stripe.

The species *Scaptius obscurata* Schaus is possibly palatable to vertebrate predators (Blest, 1964) and yet it exhibits the same type of display found in the aposematic *Viviennea*, *Ormetica*, *Ordishia*, *Selenarctia* and others. The forewings of *obscurata* have a broken pattern of yellow and brown so that the moth is probably effectively procryptic when at rest; but in the warning display posture the bright orange-red abdomen is displayed in the same way that the red abdomen of *Idalus* species is exhibited. This seems to be a Batesian situation in which the warning display behaviour and the abdominal warning coloration of the unpalatable Müllerian models are copied. There remains the possibility, however, that *obscurata* is unpalatable to certain diurnal predators and is both a Batesian and a Müllerian mimic, as most Arctiidae and Ctenuchidae do seem to be distasteful, if not actively harmful to a variety of predators (Beebe & Kennedy, 1957; Blest, 1964; Rothschild, 1960; 1961; Aplin & Rothschild, 1971 : 590).

WARNING SOUNDS

By means of their tymbal organs (the modified metepisterna), species of the *Eupseudosoma*-group, as many other species of Arctiidae and Ctenuchidae, produce a

series of ultrasonic clicks when subjected to tactile stimulation, if restrained during flight, or in response to recorded bat cries or artificially produced sound comparable in frequency and pulse repetition rate to bat cries (Blest, Collett & Pye, 1963; Blest, 1964; Dunning & Roeder, 1965; Dunning, 1968). Dunning (1968) has commented on the probable aposematic nature of Arctiid sounds and the Müllerian protection it confers. The palatability mentioned earlier, of *Scaptius obscurata*, a nocturnal species with a well developed and apparently functional tymbal organ, suggests the intriguing possibility that it may be a Batesian acoustic mimic as well as a behavioural mimic. Dunning (1968) has cited the palatable North American species *Pyrrharctia isabella* J. E. Smith as a comparable acoustic mimic.

All the species of the new genera and the type-species of most of the other Arctiid genera referred to in the text have well developed tymbal organs (see plates). These are typically globose, unscaled except posteriorly where there are often several small, rounded scales, and with discernible microtymbals (transverse or oblique corrugations of the tymbal); the tymbal organ is normally concealed by the hind femur which may afford it some protection against damage. Recognisable tymbal organs are lacking in *Disconeura* Bryk and *Paranerita* Hampson (type-species). In *Echeta divisa* Herrich-Schäffer the tymbal organ is irregularly grooved and may represent a primitive condition (see Pl. 34, fig. 210). In most species of *Echeta* the metepisternum is without microtymbals. The tymbal organ of *Glaucostola flavida* (Schaus) (Pl. 34, fig. 208) is unusual in its microtymbal pattern. The microtymbals in all the new genera typically possess a socket in each groove but in only a few specimens were hair-scales found to be present (see, for example Pl. 1, fig. 2). Pye (1973, personal communication) is currently investigating the possible function of these hair-scales; the short projection anterior to the T-junction near their base apparently functions as an anchor inhibiting lateral movement and tending to retain the hair-scale in its positions along the groove.

No sexual dimorphism of the tymbal organ has been detected in the Arctiidae studied. Rothschild & Haskell (1966), summarizing the literature on Arctiid sound emissions, have restated that the tymbal organ of the partly day-flying European *Cymbalophora* Rambur is larger in the male than in the female, and suggest that sound may have an epigamic function in this genus. The closely related Nearctic genus *Apantesis* Walker lacks microtymbals but is still capable of sound production from the metepisternum (Dunning, 1973, personal communication).

With the exception of *Glaucostola* and *Echeta*, there is little variation in the microtymbal pattern between the genera examined during the present study, which suggests that the quality of their sound emissions will prove to be similar. This can be expected from the experimental evidence that Arctiid tymbal sounds are warning signals of Müllerian partners, although there appears to be no need for exact replication of tymbal sounds between species as Dunning (1968) has found that her bats reacted similarly to *Halisidota tessellaris* Smith and *Haploa clymene* Brown clicks in spite of dominant frequency differences of as much as 20 kHz. One experimental bat, however, learnt to distinguish between *Pyrrharctia isabella* clicks and those produced by *tessellaris* and *clymene*.

SCENT-DISTRIBUTING ORGANS

The pre-mating function of male abdominal scent-brushes in some Palaearctic Noctuidae has been demonstrated by Birch (1968; 1970*a*; 1970*b*; 1972) and Aplin & Birch (1968). Comparable hair-pencils in the Danaiinae (Nymphalidae) have been reviewed by Myers (1972) and the male hair pencils of *Manduca sexta* L. (Sphingidae) discussed by Grant & Eaton (1973). There is therefore some justification for postulating that the brushes and androconial zones of Arctiidae perform the same aphrodisiac function.

Six of the eleven new genera described in this paper have identifiable scent-distributing organs in the male. There are androconial zones on the overlap areas of the fore- and hindwings in *Regobarrosia* gen. n., *Melanarctia* gen. n. and *Emurena* gen. n. (one species); an androconial patch on the overlap area of the hindwing interacting with a brush on the ventral surface of the forewing in *Astralarctia* gen. n.; and androconial zones interacting with a hair-pencil protected by the folded anal area of the ventral surface of the hindwing in *Viviennea* gen. n., *Melanarctia* gen. n., *Emurena* gen. n. (three species) and *Himerarctia* gen. n.

Some of the other genera examined during the preparation of this paper exhibit similar male scent disseminating equipment. *Cratoplastis* Felder and *Sutonocrea* Butler possess the same combination of wing-overlap androconial patches and an androconial/hair-pencil anal pouch under the hindwing as in *Melanarctia* and *Emurena fernandezi* sp. n. In *Ormetica* (p. 81) most of the species studied have anal pouch scent-organs but lack the wing-overlap androconial zones. The type-species of *Eupseudosoma* and *Paranerita* have wing-overlap androconial zones and the type-species of *Glaucostola* has a strongly developed, distally directed hair-pencil under the male forewing.

Males of *Echeta*, *Gorgonidia*, *Idalus*, *Machaeraptenus*, and the new genera *Amphelarctia*, *Ordishia*, *Selenarctia*, *Aphyarctia* and *Nyearctia* lack recognizable androconial zones and hair-pencils. Male alar scent-disseminating organs are also absent in the type-species of *Agaraea*, *Apyre*, *Araeomolis*, *Cresera*, *Demolis*, *Disconeura*, *Halisidota*, *Phaeomolis*, *Rhipha*, *Scaptius* and *Symphlebia*.

As there seems to be general conformity at the generic level in the possession of a particular type of scent-organ in the Arctiidae, and similar examples can be found in other families (for example the huge African Geometrid genus *Cleora* Curtis), it is somewhat anomalous that there is a lack of conformity between species of the genus *Emurena* gen. n. Male sex pheromones, which appear to act as aphrodisiacs immediately prior to mating (Birch, 1968; Myers, 1972), are probably generally present throughout the Lepidoptera and are apparently often distributed by means of external scent-brushes or eversible coremata. However, the absence of specialized scent-organs does not appear to inhibit the transference of male sex pheromones to the female. For example, Birch (1970) has shown that the male courtship display of Noctuid species lacking scent-organs does not differ greatly from that of species possessing scent-organs, which suggests that similar male-to-female chemical signals are involved in both groups of species; and Hidaka (1972) and Myers (1972) have supported earlier claims that male sex pheromones can be transmitted during antennal palpation. The marked difference in male scent-

organ equipment between the siblings *Emurena lurida* Felder and *E. fernandezi* sp. n. therefore may not be matched by a similar difference in their ability to chemically stimulate their mates. Varley (1972, personal communication) has made the interesting suggestion that where mating difficulties have arisen between two closely related sympatric species, it might be genetically simpler to lose the male scent-organs in one of the species concerned—an explanation which may apply to *lurida* and *fernandezi*. In this situation it would be necessary for the organ-less species (*lurida*) to employ alternative methods of scent transference. Whether *lurida* has sucessfully achieved this is doubtful; if *lurida* is a rare species, as indicated by its rarity in collections, it could be argued that while the loss of male scent-organs may have inhibited wasteful cross-mating with *fernandezi* it may also have decreased the number of successful matings between male and female *lurida*.

EARLY STAGES

Little seems to be known about the life-history or early stages of the majority of non-Holarctic Arctiidae. The 149 species mentioned in the present paper are no exception. Only one species is known from the larva, *Disconeura inexpectata* (p. 70); its dorsal hairs have irritant properties.

ABBREVIATIONS OF DEPOSITORIES

BMNH	British Museum (Natural History).
CM	Carnegie Museum, Pittsburgh, U.S.A.
LACM	Los Angeles County Museum, U.S.A.
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.
NM	Naturhistorisches Museum, Vienna, Austria.
NR	Naturhistoriska Riksmuseet, Stockholm.
UCV	Universidad Central de Venezuela, Maracay, Venezuela.
UM	University Museum, Oxford, England.
USNM	Smithsonian Institution, National Museum of Natural History, Washington, D.C., U.S.A.
ZSBS	Zoologische Sammlung des Bayerischen Staates, Munich ,West Germany.

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RECLASSIFICATION OF SPECIES FORMERLY IN *AUTOMOLIS*

New genera

***VIVIENNEA* gen. n.** [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]
[*Rhipha* Walker sensu Travassos & Travassos, 1954 : 217. Partim.]

Type-species: *Automolis moma* Schaus, 1905 : 218.

♂. Palp extending to about middle of clypeo-frons; apical segment of palp minute. Head without processes. Antenna uniserate, each segment with numerous setae on ventral surface. Patagia yellow, or mainly yellow. Tegulae yellow anteriorly. Midleg with pair of terminal spurs; hindleg with terminal pair and subterminal pair of spurs. Forewing brown with yellow or orange-yellow markings, or yellow with brown markings (*salma* and *superba*); venation as in text-figure. Tymbal organ with between 50 and 60 microtymbals. Hindwing either entirely yellow (some specimens of *salma*) or yellow proximally, and brown distally; folded anal area contains scent-scales and hair-pencil on ventral side. Abdomen orange or yellow, and dark brown; dorsal surface of at least terminal segment moderately strongly iridescent dark brown and green or blue.

♂ genitalia. Eighth abdominal tergite with short apodemes; eighth sternite with vestigial apodemes. Saccus small. Valves simple, apex acuminate, rounded or spatulate; heavily sclerotized in *moma, momyra, tegyra, gyrata, superba* and *salma*; less heavily sclerotized in *flavicincta, dolens, ardesiaca* and *griseonitens*. Uncus tapered posteriorly and spinose dorsally in *moma*-group; truncate apically in *flavicincta*-group with dorsal carina and two lateral carinae. Aedeagus with spinose process at apex; lobes of vesica variously scobinate.

♀. Similar to ♂ but hindwing relatively greater in area, its outer margin more strongly convex, and anal area without recognizable scent-organ; antennae filiform with pair of long setae on ventral surface of proximal segments.

♀ genitalia. The posterior margin of 7th sternite straight or weakly concave, lamella postvaginalis emarginate medially. Ductus bursae short and broad; sclerotized posteriorly. Corpus bursae with two small circular signa; appendix bursae arising from right side of corpus bursae, either posteriorly (species other than *salma* and *superba*) or anteriorly (*salma* and *superba*). Ductus seminalis opening with appendix bursae near connection of latter with corpus bursae. Anterior apophyses short; posterior apophyses longer than latter. Paired scent tubules short in *moma*-group, broader and much longer in *flavicincta*-group [these open onto the dorsal surface of the abdomen at the base of each papilla anales].

Vivienna is probably most closely related to *Ordishia*, which it resembles in several external and genitalic characters. It can be distinguished from *Ordishia* by the following features: patagia yellow or mainly yellow; absence of longitudinal bands on tegulae and of pale, mid-dorsal line on thorax; presence of proximal (antemedial) yellow transverse band on forewing (or base of wing entirely yellow); presence of folded anal scent area in male; dorsal surface of terminal (posterior) segment of abdomen moderately strongly iridescent brown and blue or green; uncus either tapered posteriorly or dilated with lateral carinae; aedeagus with

spinose process at apex; posterior margin of lamella antevaginalis not strongly concave, and not emarginate medially.

The 12 included species can be separated into two groups: those with a tapered uncus and with either almost completely yellow forewings (*salma* and *superba*) or with the distal (postmedial) yellow band of forewing approximately parallel to proximal (antemedial) yellow band (*moma*, *momyra*, *tegyra*, *gyrata* and *euricosilvae*) and, secondly, those species with an apically dilated and laterally carinate uncus and with distal yellow band of forewing nearly at right angles to proximal yellow band (*flavicincta*, *dolens*, *zonana*, *ardesiaca* and *griseonitens*).

The species *momyra*, *tegyra* and *euricosilvae* have been transferred from *Rhipha* Walker, the remainder from *Automolis* Hübner.

The placement of some species of this genus in *Rhipha* by Travassos was based on genitalic characters which are shared by several genera in the tribe Phaegopterini and is untenable.

The species *tegyra* and *salma* were studied by Blest (1964). Both responded to tactile stimuli with a display pattern in which the wings are alternately raised and lowered and the abdomen raised (see Blest, 1964 : fig. 12). The iridescent posterior end of the abdomen of some species of *Viviennea* (matched for example in *Ormetica*) presumably acts as a particularly conspicuous component of the aposematic signal to diurnal predators. Both species examined by Blest were rejected by *Cebus* monkeys.

There are three apparent Müllerian associations in this genus. The first includes *moma* and *euricosilvae*; the second *flavicincta*, *dolens*, *zonana*, *ardesiaca* and *griseonitens*; the third *salma* and *superba*. The members of this third group may form part of a larger and intergeneric Müllerian complex with similarly coloured species of *Selenarctia* and *Ormetica* (*postradiata* Schaus, *pauperis* Schaus, *ochreomarginata* Joicey & Talbot, *codasi* Jörgensen, *bonora* Schaus, *goloma* Schaus and possibly *orbona* Schaus). Some species of both *Selenarctia* and *Ormetica* have been shown to be unpalatable (Blest, 1964) and are therefore Müllerian candidates.

The distribution of *Viviennea* includes Belize, Guatemala, Costa Rica, Panama, Colombia, Venezuela, French Guiana, Guyana, Ecuador, Peru, Bolivia, Paraguay and Brazil.

Nothing is known about the early stages.

Key to Species

1 Forewing yellow, with small, dark brown markings. Thorax yellow dorsally . 12
– Forewing brown, with yellow bands. Thorax not uniformly yellow dorsally . 2
2 Distal yellow band of forewing nearly parallel to proximal yellow band. Dorsal surface of abdominal segment 8 strongly iridescent dark brown, blue and green 3
– Distal yellow band of forewing nearly at right-angle to proximal yellow band, or absent. Dorsal surface of abdominal segment 8 not strongly iridescent . . 7
3 Distal yellow band of forewing constructed at middle (see Pl. 4, fig. 21) ***euricosilvai*** (p. 17)
– Distal yellow band of forewing unconstricted or weakly constricted at middle . 4
4 Anterior half of abdomen orange dorsally 5
– Anterior half of abdomen black or dark greyish brown dorsally 6

5 Distal yellow band of forewing sinuous (see Pl. 2, fig. 6) . . . ***tegyra*** (p. 16)
– Distal yellow band of forewing straight or nearly so; not sinuous . ***momyra*** (p. 15)
6 Distal yellow band of forewing sinuous . . . . . ***gyrata*** (p. 17)
– Distal yellow band of forewing straight or nearly so; not sinuous . ***moma*** (p. 13)
7 Forewing with short yellow marking near anal angle extending along Cu_{1b} from outer margin see Pl. 6, fig. 33) 8
– Forewing without yellow marking at Cu_{1b} 9
8 Outer margin of distal yellow band on forewing weakly concave; yellow marking at Cu_{1b} digitate . . . . . ***zonana*** (p. 22)
– Outer margin of distal yellow band on forewing strongly concave; yellow marking triangular (absent in some specimens). . . . . ***dolens*** (p. 21)
9 Outer margin of distal yellow band on forewing strongly concave. . ***dolens*** (p. 21)
– Outer margin of distal yellow band on forewing straight or weakly concave . . 10
10 Veins in brown areas of upper surface of forewing marked with pale brown scales; ground-colour of brown areas uniform in coloration . . ***flavicincta*** (p. 19)
– Veins in brown areas of upper surface of forewing unmarked; ground-colour of brown areas darker apically and at base of wing 11
11 Proximal yellow band on forewing edged distally with dark brown. Dark areas of head, thorax and abdomen strongly iridescent dark brown and greenish blue ***griseonitens*** (p. 24)
– Proximal yellow band on forewing without dark distal edge. Dark areas of head, thorax and abdomen weakly iridescent greyish brown and greenish blue ***ardesiaca*** (p. 23)
12 Forewing with brown apical marking as large as or larger than brown tornal spot. Apex of valve in ♂ genitalia not acuminate. Lamella postvaginalis in ♀ genitalia weakly emarginate . . . . . ***superba*** (p. 17)
– Forewing without brown apical marking on forewing or with this marking smaller than tornal spot. Apex of valve in ♂ genitalia acuminate. Lamella postvaginalis in ♀ genitalia strongly emarginate . . . . . ***salma*** (p. 18)

Viviennea moma (Schaus) comb. n.

(Text-figs 1, 2; Pl. 1, figs 1–5; Pl. 2, figs 8–10)

Automolis moma Schaus, 1905 : 218. Holotype ♂, GUYANA (USNM) [examined].
Automolis moma tenuifascia Rothschild, 1917 : 481. Holotype ♀, BRAZIL (BMNH) [examined]. [Synonymized by Hampson, 1920 : 175.]
Automolis moma Schaus; Strand, 1919 : 21.
Automolis moma Schaus; Hampson, 1920 : 175.
Automolis moma Schaus; Seitz, 1922 : 373.
Rhipha moma (Schaus) Travassos, 1954 : 217.
Automolis moma Schaus; Watson, 1971 : 61 [fig. of ♂ genitalia].

♂. Palps, antennae, vertex and side of head dark greyish brown, nearly black; front of head as for vertex but with iridescent blue and green area above labrum. Patagia yellow; tegulae nearly black except for yellow anterior band; rest of thorax nearly black dorsally; ventral surface of thorax brown, less dark than dorsal surface. Front surface of foreleg coxae dark brown and slightly iridescent bluish green, outer surface brilliantly iridescent blue and green; rest of legs as for front of coxa. Some iridescent blue and green scales posterior to tymbal organ. Upper surface of forewing dark greyish brown with two yellow transverse bands and with iridescent blue and green patch at base. Upper surface of hindwing dark greyish brown distally, pale yellow proximally with some dark brown scales in anal area. Under surface of hindwings as upper surface, but paler. Segments 1–3 of abdomen nearly black dorsally; segment 4 either uniformly nearly black dorsally (as in holotype), or black with medial, orange

patch; in a few specimens (not the holotype) there is a black, lateral spot on each side of segments 3–7; segments 5–7 orange dorsally (in type and most specimens), with purple and pale blue iridescence posteriorly on each segment; 7 black, or black with orange medial spot in some specimens; segment 8 brilliantly iridescent black, blue and green. Ventral surface of segment 2 black laterally, orange medially; segments 3–7 orange, each with pair black lateral spots, absent on 7 in four specimens (type abdomen was worn); segment 8 orange anteriorly, iridescent dark brown, blue and green posteriorly.

♀. Similar to male. Differs in narrower distal, yellow band on forewing, especially type of *tenuifascia*, and less extensive yellow proximal area in hindwing. Coloration of abdomen differs as follows: orange band on dorsal surface much narrower, mainly as result of increase in posterior dark brown area which may extend anteriorly to include segment 5 (except for orange medial patch); posterior segments brilliantly lustrous only at posterior margin of segments; ventrally dark brown, with or without orange lateral patches.

Forewing length: holotype ♂, 21·5 mm; ♂ 18·5—22·0 mm; ♀ 23·0–24·5 mm.

♂ genitalia. Uncus tapered; valves arcuate and dilate distally; aedeagus with serrate, apical process; vesica with several lobes.

♀ genitalia. Lamella postvaginalis with broadly V-shaped posterior margin; ductus bursae sclerotized posteriorly; accessory sac of corpus bursae as large as latter; posterior margin of 7th sternite weakly concave, finely serrate laterally.

Separable from *momyra*, *tegyra* and *gyrata* by the evenly rounded apex to the valve in the male genitalia (each of the latter three species has small pointed process at the apex of the valve). Both *momyra* and *tegyra* have much more orange on the dorsal surface of the abdomen than in *moma*, with no black on the anterior half, and *tegyra* is further distinguished by the sinuous, distal, yellow band on the forewing. The type and only known specimen of the nominal species *gyrata* possesses the sinuous, distal, yellow band on the forewing, as in *tegyra*, whereas the abdomen is typical of *moma*.

With so little Central American material available, it is difficult to comment about the validity of the names *momyra*, *tegyra* and *gyrata*. On present evidence they seem to represent discrete, allopatric entities, which may prove to form a superspecies (*Artenkreis*) with *moma*, or a single polytypic species without *moma* (from which all three can be separated by the shape of the valva).

The type of Rothschild's *tenuifascia* is simply a female of *moma*.

Specimens have been identified from the eastern arm of the Andes in Colombia (or from east of the Andes), from Venezuela, French Guiana, Brazil, Peru and Bolivia. The western arm of the Andes may form a dispersal barrier in Colombia – all four specimens of *momyra*, for which possible subspecific or superspecific separation from *moma* has been suggested above, were collected in localities west of this western arm, from where none of the apparently more eastern *moma* have been taken. There is no record of the nominal species *gyrata* or *tegyra* east of the type-locality of the latter – Chiriqui, Panama.

Material examined.

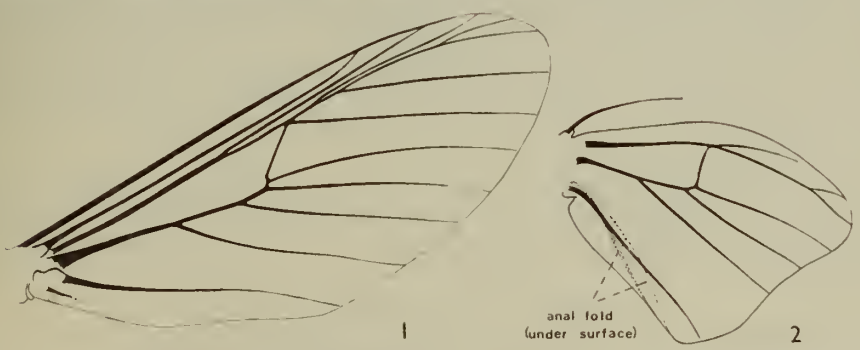
Automolis moma Schaus, holotype ♂, Guyana: Omai (USNM). *Automolis moma tenuifascia* Rothschild, holotype ♀, Brazil: Sta Catarina (BMNH).

Colombia: 1 ♂, Bellavista, iv.1913 (CM); 2 ♂, Pacho, 2200 m (*Fassl*) (USNM: 1 ♂); 1 ♂, Villavicencio, 400 m (*Fassl*); 7 ♂, Rio Negro, 800 m (*Fassl*); 1 ♂, Medina, 500 m (*Fassl*)

(USNM). PERU: 3 ♂, Rio Inambari, La Oroya, 3100 ft, [ix.1904, ix, xii.1905 (*Ockenden*); 1 ♂, Rio Huacamayo, La Union, Carabaya, 2000 ft, xi.1904 (*Ockenden*); 2 ♂, S. Domingo, Carabaya, 6000 ft, 6500 ft, iv, ix.1902 (*Ockenden*); 3 ♂, Upper Maranon, Rentema Falls, 1000 ft (*A. & E. Pratt*); 4 ♂, Dept. Pasco, 22 km S.E. Icsozazin, Chontilla, vii.1961 (*Truxall*) (LACM); 1 ♂, Dept. Pasco, Pande Azucar, vii.1961 (*Truxall*) (LACM); 2 ♂, Huanuco, Tingo Maria 800 m, 21–23.viii.1971 (*Vardy*). VENEZUELA: 10 ♂, Tachira, La Motita, 300 m, 8–14, 2–4.viii.1972 (*D'Ascoli, Montagne, Salcedo*) (UCV); 2 ♀, Esteban Valley, Las Quiguas (USNM: 1 ♀); 1 ♀, near San Esteban, Las Quiguas (*Klages*); 1 ♂, Aragua, Barinitas, 22–26.ii.1969 (*Duckworth, Dietz*) (USNM); 1 ♀, Carabobo, Rio Borburata, 250 m, 8.iv.1950 (*Fernández Yépez*) (UCV); 8 ♂, 1 ♀, Aragua, Rancho Grande, 1100 m, 10.ii–12.xi.1964–1969 (*Fernández Yépez, Perez, Duckworth, Dietz, Poole*) (UCV, USNM); 1 ♂, Zulia, Kasmera, 250 m, 19.ix.1961 (*Fernández Yépez, Rosales*) (UCV); 4 ♂, 1 ♀, Bolivar, 107 km and 125 km from El Dorado towards Sta Elena, 520 m and 1100 m, 13–16.viii.1957, 21.ix.1967 (*Fernández Yépez, Rosales, Gelbez, Rodriguez V.*) (UCV); 1 ♂, Bolivar, Auyantepui, Guayaraca, 1100 m, 14.iv.1956 (*Fernández Yépez, Rosales*) (UCV); 1 ♂, Amazonas, Mt Marahuaca, N. slopes, 1–25.v.1950 (USNM). FRENCH GUIANA: 1 ♂, Mana River, v.1917; 1 ♂, Maroni River, St Laurent, vii–ix.1915; 1 ♂, Oyapok River, Pied Saut (*Klages*). GUYANA: 1 ♂, Omai (USNM). BOLIVIA: 11 ♂, Rio Songo, 750 m (*Fassl*) (USNM: 2 ♂); 1 ♂, Buenavista, 750 m, vii.1906–iv.1907 (*Steinbach*); 6 ♂, Coroico, 1500 m (*Fassl*) (USNM: 1 ♀, MNHU: 1 ♂); 1 ♂, i.1913; 1 ♂, Dept. Sta Cruz, Prov. del Sara, 450 (*Steinbach*). BRAZIL: 1 ♂ (*Staudinger*) (MNHU); 46 ♂, 1 ♀, Pará (mostly collected by *Moss*); 1 ♂, Rio de Janeiro; 1 ♂, Rio State, Itatiaia, 1300 m, 10–12.xi.1950 (*Silva, Albuquerque, Pearson, Eber*); 2 ♂, Itatiaia, Séde, 800, 3–4.x.1953, 3–4.iv.1954 (*Pearson, Oiticica*); 1 ♂, Itatiaia, Lago Azul, 800, 20–22.vi.1955 (*Barros, Albuquerque, Pearson*); 2 ♂, Itatiaia, Maromba, 17.viii.1952 (*Pearson*); 6 ♂, Rio State, Terezópolis, Barreira, 350., 30.x–3.xi.1956 (*Pearson*); 2 ♂, São Paulo, Alto de Sierra, iii.1926, ix.1928 (*Spitz*); 1 ♂, Joinville (*Arp*); ♂, Sta Catarina, Jaragua do Sul, ix.1932 (Hoffman); 1 ♂, Sta Catarina, hills between Hansa and Jaragua, 400 m, v.1935 (*Maller*); 4 ♂, Sta Catarina, Hansa Humboldt, 60 m, vi.1935 (*Maller*) (USNM: 2 ♂); 1 ♂, Sta Catarina (*Johnson*); 3 ♂, Sta Catarina; 8 ♂, São Paulo de Olivença, viii–xii, 1932–1935 (*Hoffmann, Waehner* and others) (USNM: 2 ♂); 1 ♂, Santo Antonio do Javary, v.1907 (*Klages*); 1 ♂, Teffé, ix.1907 Mathan); 5 ♂, Fonte Boa, vi.1906, vii–viii.1907 (*Klages*); 1 ♀, Teffé (CM); 1 ♂, Amazonas, Porto Velho, 26.x.1929 (*Fountaine*); 2 ♂, Rio Purus, Hyutanahan (*Klages*); 1 ♂, Tucantins, ix.

Viviennea momyra (Gaede) comb. n.

Automolis momyra Gaede, 1928 : 28. Holotype ♂, COLOMBIA (MNHU) [examined].
Rhipha momyra (Gaede) Travassos, 1954 : 219.



FIGS 1, 2. *Viviennea momyra*, ♂, venation. 1, forewing; 2, hindwing. The anal fold under the hindwing encloses a scent-organ (see Pl. 1, figs 3, 4).

♂. Head, thorax and appendages as for *moma* (q.v.). Abdominal segments 1–4 orange dorsally, with dark brown, medial spot on segment 2 in type and one male (this spot absent in other two males and the female); 5 and 6 deep orange; 7 and 8 dark brown, iridescent blue and green at posterior border of each segment. Pleural region of abdomen deep orange. Ventral surface of segment 2 orange, with posteriorly tapered, triangular area of iridescent blue laterally on each side; 3–7 orange; 8 dark brown, weakly iridescent blue posteriorly.

♀. Differs from male in the narrower, distal, yellow band on forewing and the smaller yellow proximal area on hindwing.

Forewing length: holotype ♂ 21·0 mm; ♂ 21·5 and 23·0 mm; ♀ 25·00 mm.

♂ genitalia. As for *moma* but apex of valve with pointed process.

♀ genitalia. As for *moma*.

Apparently replaces *moma* in Colombia to the west of the western arm of the Andes (see *moma*).

MATERIAL EXAMINED.

Automolis momyra Gaede, holotype ♂, COLOMBIA: W., Bella Vista, viii.1927 (MNHU).

COLOMBIA: 2 ♂, 1 ♀, between Tumaco and Pasto (*Niepelt*): 1 ♂, Buena Vista (*Patchett*) (USNM).

Viviennea tegyra (Druce) comb. n.

(Pl. 1, fig. 6; Pl. 2, figs 11, 12)

Automolis tegyra Druce, 1896 : 36. LECTOTYPE ♂, PANAMA (MNHU), here designated [examined].
Automolis tegyra Druce; Strand, 1919 : 25.
Automolis tegyra Druce; Seitz, 1922 : 373.
Rhipha tegyra (Druce) Travassos, 1954 : 217.
Automolis tegyra Druce; Blest, 1964.

♂. As for *momyra*, except for sinuous, distal, yellow band of forewing. Two of the Costa Rican males have a dark brown spot present on segment 2 of the abdomen [present in type of *momyra*]; the male from Belize has the dorsal surface of 1–3 and 7–8 dark brown.

♀. As for ♂, but distal, yellow band of forewing narrower, and proximal, yellow area of hindwing smaller. Dorsal surface of abdomen orange from segments 1–4; 5 orange with iridescent dark brown and blue posterior margin; 6 dark brown, except anterolaterally; 7 dark brown, iridescent blue at posterior margin; black pleural patches on 2–5; ventral surface of 2 orange with posteriorly tapered, iridescent black and blue, triangular markings on each side; 3–5 orange ventrally, the latter black at posterior margin except at middle; 6 and 7 black ventrally.

Forewing length: ♂ 19·5–21·0 mm; ♀ 26·5 mm.

♂ and ♀ genitalia as for *momyra*.

Replaces the South American *moma* in Central America as far north as Guatemala where another nominal species *gyrata* replaces it. (See discussion of affinities under *moma*.)

MATERIAL EXAMINED.

Automolis tegyra Druce, lectotype ♂, PANAMA, Chiriqui (MNHU).

COSTA RICA: 1 ♂; 2 ♂, 1 ♀ Tuis, viii. (USNM, 1 ♂; CM, 1 ♀); 1 ♂, 1 ♀, Juan Viñas, 3500 ft,

vi. (USNM, 1 ♀); 2 ♂, Puntarenas Province, Osa Peninsula, 1·8 mi. W. of Rincon, 4.iii.1971 (*Donahue & Hogue*) (LACM). BELIZE: 1 ♂, Punta Gorda, iv.1933 (*White*). PANAMA: 1 ♀, Lino, 800 m (*Fassl*) (USNM).

Viviennea gyrata (Schaus) comb. n.

Automolis gyrata Schaus, 1920 : 117. Holotype ♂, GUATEMALA (USNM) [examined].
Automolis gyrata Schaus; Watson, 1971 : 41.

♂. As for *tegyra*, but abdomen like that of *moma*; segments 1–3 black dorsally, 2 and 3 with lateral orange patches; 4–6 orange, 7 and 8 black, 7 with iridescent blue and green posterior margin, 8 with iridescent blue and green lateral patches; ventral surface of 2 orange medially, black laterally, 3–7 orange with small black lateral spot on each side, 8 black with iridescent blue and green patch on each side.

♀. Not known.

Forewing length: holotype ♂ 22·0 mm.

♂ genitalia as for *momyra* and *tegyra*.

Known only from the holotype. Further material is needed to show whether the colour-pattern of the dorsal surface of the type abdomen is typical of Guatemalan specimens – if it is not, *gyrata* can be placed in the synonymy of *tegyra*.

MATERIAL EXAMINED.

Automolis gyrata Schaus, holotype ♂, GUATEMALA: Cayuga (USNM).

Viviennea euricosilvai (Travassos & Travassos) comb. n.

(Pl. 4, figs 21–23)

Rhipha euricosilvai Travassos & Travassos, 1954 : 213, 13 figs. Holotype ♂, BRAZIL (Department of Zoology, Agriculture Secretariat, São Paulo State) [not examined].

Distinguished from the previous four nominal species by the colour-pattern of the wings and abdomen, and in the male genitalia particularly by the shape of the valves and apical process of the aedeagus. Judging by the figure of the female genitalia accompanying the original description of this species, the shape of the posterior margin of both the lamella postvaginalis and 7th abdominal sternite is probably similarly diagnostic. The species is well illustrated by its authors, and is described in detail.

Recorded from the mountains of the Sierra da Mantiqueira which extend across the border of the Brazilian states São Paulo and Rio.

MATERIAL EXAMINED.

BRAZIL: 2 ♂, Itatiaia (Maromba), 28.vii.1952 (*Pearson & Oiticica*) (paratypes 582 and 583) (BMNH).

Viviennea superba (Druce) comb. n.

(Pl. 3, figs 17–20)

Automolis superba Druce, 1883 : 382, pl. 40, fig. 8. LECTOTYPE ♀, ECUADOR (BMNH), here designated [examined].

Automolis sulfurea Schaus, 1905 : 216. Holotype ♀, French Guiana (USNM) [examined]. **Syn. n.**
Automolis sulfurea Schaus; Hampson, 1920 : 161, pl. 46, fig. 21 (colour).
Automolis superba Druce; Seitz, 1921 : 368.
Ormetica sulfurea (Schaus) Watson, 1971 : 88 [fig. of ♀ genitalia].

♂. Palps greyish brown and weakly iridescent bluish green; ventral two-thirds of front of head iridescent turquoise, dorsal third greyish brown; vertex yellow; antennae greyish brown. Whole of dorsal surface of thorax yellow; ventral surface greyish brown. Legs greyish brown, with weak, bluish green iridescence, except for concave outer surface of coxa and posterior or ventral surface of femur which are iridescent turquoise. Upper surface of forewing yellow, with dark brown apical spot and smaller spot near tornus on anal margin; hind wing light yellow anteriorly, pale orange anally, with dark brown terminal band. Under surface of both wings yellow; markings as for upper surface. Dorsal surface of abdomen orange anteriorly; segments 7–8 (and 6, usually) dark blue, iridescent in posterior half of each segment. Ventral surface of abdomen orange-yellow except for segment 2 which is brown and iridescent turquoise and segment 3 which has brown patch on each side.

♀. Similar to male but outer margin of hindwing more strongly convex and abdomen with more extensive blue scaling. On the dorsal surface of the lectotype abdomen, segments 1 and 2 are yellow, 3 yellow with lateral blue patch on each side and blue posteromedial patch, 4–7 are blue with turquoise iridescent posteriorly on each segment; and on the ventral surface 2 is as for ♂, but both 2 and 2 have dark lateral patches.

Forewing length: lectotype ♀ 20·5 mm; ♂ 17·5–18·5 mm; ♀ 19·5 mm.

♂ genitalia. Uncus tapered posteriorly, minutely spinose dorsally; valves digitate, heavily sclerotized, apex not acuminate but some examples with short, rounded process at ventromedial side of apex; aedeagus with minute, toothed process at apex; vesica with two main scobinate lobes, the scobinations continuous between lobes on one side of vesica.

♀. Accessory sac of corpus bursae opening anterolaterally into right side of corpus bursae; lamella postvaginalis weakly emarginate medially.

Distinguished from *salma* by the presence of a large, brown, apical spot on the forewing; this spot as large as or larger than the brown tornal spot. In the male genitalia the non-acuminate valve is diagnostic, while in the female the lamella postvaginalis is weakly emarginate unlike that of *salma*.

Known from French Guiana, Brazil, Peru and Ecuador.

Material examined.

Automolis superba Druce, lectotype ♀, Ecuador: Sarayacu (*Buckley*) (BMNH). *Automolis sulfurea* Schaus, holotype ♀, French Guiana: Maroni River, St Jean (USNM).

French Guiana: 2 ♂, Maroni River, St Laurent, vii–ix.1915; 1 ♂, Maroni River, St Jean (*Le Moult*) (USNM); 1 ♂, Nouveau Chantier (*Le Moult*); 1 ♂, Oyapak River, Pied Saut (*Klages*). Brazil: 2 ♂, Pará (*Moss*); 2 ♂, Rio Purus, Hyutanahan (*Klages*) (CM: 1 ♂); 1 ♂, Rio Purus, Nova Olinda (*Klages*); 1 ♂, Fonte Boa, v.1906 (*Klages*); 1 ♀, Teffé: 1 ♂, Amazonas, São Paulo de Olivença, xi–xii (*Fassl*) (USNM). Peru: 3 ♂, Amazonas, Cavallo-Cocho, v–vii.1884 (*Mathan*).

Viviennea salma (Druce) comb. n.

(Pl. 3, figs 13–16)

Automolis salma Druce, 1896 : 36. LECTOTYPE ♂, Panama (MNHU), here designated [examined].

Automolis salma Druce; Strand, 1919 : 23. [Partim.]
Automolis salma Druce; Seitz, 1921 : 368.
Automolis salma whitei Rothschild, 1935 : 241. LECTOTYPE ♂, BELIZE (BMNH), here designated [examined]. **Syn. n.**
Automolis salma Druce; Blest, 1964.

As for *superba*, but apical spot on forewing either absent (as in lectotype) or greatly reduced; this apical marking smaller than tornal spot.

Forewing length: lectotype ♂ 18·0 mm; ♂ 18·0–20·5 mm; ♀ 20·5–22·0 mm.
♂ genitalia. Valve tapered apically, acuminate in some specimens.
♀ genitalia. Lamella postvaginalis strongly emarginate medially.

There is some variation in the colour-pattern of the fore- and hindwing in this species. The variation in the apical marking of the forewing is mentioned above; that exhibited in the hindwing may be at least partly geographic. All five specimens from Belize lack the dark outer-marginal band on the hind wing, as does the lectotype from Panama and the only two specimens from Colombia. The single Guyanan specimen and all the Venezuelan specimens examined are intermediate in possessing a much reduced outer marginal band; the remaining specimens studied have a normally developed band with the exception of a single specimen from Rio State, Brazil.

Blest's (1964) experiments showed that *salma* is probably unpalatable to predators. The close similarity in colour-pattern between *salma*, *V. superba*, and several species of *Ormetica* is probably Müllerian in character. (See generic entry.)

MATERIAL EXAMINED.

Automolis salma Druce, lectotype ♂, PANAMA: Chiriqui (MNHU). [There is a second label 'Columbia, Kalbreyer' on the pin of Druce's type, but this is not mentioned in the original description of the species.] *Automolis salma whitei* Rothschild, lectotype ♂, BELIZE: Punta Gorda, vii.1933 (*White*) (BMNH).

BELIZE: 4 ♂, Punta Gorda, vii–viii.1933–1934 (*White*) (BMNH: 2 ♂ and 1 ♂ paralectotype; USNM: 1 ♂). COLOMBIA: 1 ♂ (*Kalbreyer*); 1 ♂, Upper Negro River, 800 m (*Fassl*). VENEZUELA: 2 ♂, Monagas, Jusepin, 23–24.ix.1965 (*Fernández Yépez, Rosales*) (UCV); 2 ♂ Bolivar, Kanarakuni (*Fernández Yépez*) (UCV); 2 ♂, Bolivar, El Dorado, Sta Elena km 38, 160 m, 2.ix.1957 (*Fernández Yépez, Rosales*) (UCV); 1 ♀, Bolivar, Caura River, Guyapa, 24.xi–10.xii.1902 (*Klages*). FRENCH GUIANA: 1 ♂, Maroni River, St Laurent (USNM) GUYANA: 1 ♀, Tumatumari, xii.1907 (*Klages*). SURINAM: 1 ♀ (MNHU). BOLIVIA: 1 ♂, Rio Songo, 750 m (*Fassl*). BRAZIL: 1 ♂, São Paulo, I. do Cardosa, x.1934 (*Spitz*); 1 ♂, Rio State, Teresópolis, Barreira, 400 m, 20–22.ix.1957 (*Pearson*); 1 ♂, Rio State, Itatiaia, 800 m (*Travassos, Pearson*); 2 ♂, Sta Catarina, Hansa Humboldt, vi–x.1935 to vii.1936 (*Maller*) (USNM: 1 ♂, 1 ♀); 1 ♀, Sta Catarina, Rio Laeiss, Neu Bremen, iv.1936 (Hoffmann); 7 ♂, 1 ♀, Sta Catarina, Jaragua do Sul, ix.1932–viii.1935 (*Hoffmann*); 1 ♂, Joinville (*Arp*) (USNM); 1 ♂, Rio, Camp Bello (*Zikan*) (USNM).

Viviennea flavicincta (Herrich-Schäffer) **nom. rev., comb. n.**

(Pl. 4, figs 24–26; Pl. 5, figs 27, 28)

Creatonotus flavicinctus Herrich-Schäffer, [1855] : pl. 75, fig. 433 (wrappers). LECTOTYPE ♀, BRAZIL (MNHU), here designated [examined].

Automolis angulosa Walker, 1856 : 1634. LECTOTYPE ♂ (not ♀ as stated by Walker), Brazil (UM), here designated [examined].
Euplesia flavicincta (Herrich-Schäffer); Kirby, 1892 : 167.
Automolis angulosa Walker; Strand, 1919 : 14.
Automolis immaculata Rothschild, 1933 : 171. LECTOTYPE ♂, Brazil (BMNH), here designated [examined]. **Syn. n.**
Automolis spitzi Rothschild, 1935 : 241. Holotype ♂, Brazil (BMNH) [examined]. **Syn. n.**

♂. Palps dark brown and weakly iridescent blue and green. Front of head and anterior part of vertex dark brown and iridescent blue and green; posterior part of vertex dark brown. Antenna lustrous dark brown. Patagia deep yellow or yellow, except for dark brown band along anterior margin; tegulae deep yellow or yellow anterior to wing-base, otherwise dark brown; remainder of thorax dark brown and iridescent blue and green, with deep yellow or yellow posterior margin. Legs dark brown, with blue and green iridescence. Upper surface of forewing dark brown, the veins marked by pale brown (except in one paralectotype of *immaculata*), two transverse bands deep yellow or yellow. Hindwing dark brown distally (paler than forewing) with weak blue and green iridescence at anal angle; yellow proximally with deep yellow along anal margin. Under surface of forewing as for upper surface, but paler, and with some yellow scales towards posterior margin of brown proximal area. Under surface of hindwing as upper surface, but deep yellow along costa, and with dark brown marking along proximal fifth of costa. Dorsal surface of segment 1 of abdomen deep yellow or yellow, remaining segments dark brown dorsally with blue and green iridescence. Ventral surface of abdomen dark brown with blue and green iridescence, and with deep yellow or yellow medial markings on segments 2–6 (and usually 7), the yellow markings tapered posteriorly on each segment or constricted at middle.

♀. Similar to male, but outer margin of forewing more strongly convex and with dark brown distal band of hindwing broader than proximal yellow band.

Forewing length: lectotype ♀ 25·0 mm approx. (wings damaged); 18·5–23·0 mm; ♀ 23·0–26·0 mm.

♂ genitalia. Uncus slightly dilated posteriorly, with weak medial carina; apex of valve evenly rounded or angled posterolaterally; apex of aedeagus with finely spinose tubercle; vesica with two large scobinate lobes, the larger lobe with two accessory lobes on one side.

♀ genitalia. Lamella postvaginalis with U-shaped medial emargination; ductus bursae sclerotized at ostium only; accessory sac of corpus bursae smaller than latter; posterior margin of 7th sternite evenly concave medially.

The type of *immaculata* (mis-labelled 'amacula' by Rothschild on the pin-label), which was compared with *dolens* by its author, differs little from the type of *angulosa*. The type of *spitzi* differs from other males of *flavicincta* examined in the presence of yellow scales in the middle of each tegula, but is otherwise similar to the type of *angulosa* [two other specimens of *dolens* in the BMNH have similarly coloured tegulae].

Seitz wrongly treated *griseonitens* and *ardesiaca* as subspecies of *angulosa*.

The moth figured by Herrich-Schäffer as *flavicincta* was almost certainly a male, whereas the only Herrich-Schäffer specimen in the Berlin collection is a female. The pin-labels of this specimen leave little doubt, however, that it is one of the original series.

I can find no difference in the genitalia between specimens of *flavicincta* and *dolens*. Externally most specimens of *dolens* have entirely yellow tegulae, outer marginal extensions of the distal yellow band on the forewing (except lectotype and male paralectotype of *immarginata*), the distal margin of the pre-apical yellow band of the forewing much more strongly concave and have less well marked veins

than in most specimens of *flavicincta*. On the evidence of the material examined, it is reasonable to treat *dolens* and *flavicincta* as distinct species. When longer series from a much more extensive number of localities are available, ideally together with bred material, a taxonomic re-assessment can be made.

Known only from south-eastern Brazil.

MATERIAL EXAMINED.

Creatonotus flavicinctus Herrich-Schäffer, lectotype ♀, [BRAZIL]: (MNHU). *Automolis immaculata* Rothschild, lectotype ♂, BRAZIL: São Paulo, Alto de Serra, v.1926 (*Spitz*) (BMNH). *Automolis spitzi* Rothschild, holotype ♂, BRAZIL: São Paulo, Cantareira, iv.1931 (*Spitz*) (BMNH). *Automolis angulosa* Walker, lectotype ♂, BRAZIL. [Although described from supposedly female material, there is little doubt that the latter is part of the syntypic series, or was possibly the only specimen available to Walker.]

BRAZIL: 7 ♂, 1 ♀, Sta Catarina (USNM: 6 ♂, 1 ♀); 15 ♂, Sta Catarina, Jaragua do Sul, ix–x.1932, vi–viii.1935 (*Hoffmann, Maller*); 9 ♂, 1 ♀, Sta Catarina, Hansa Humboldt, 60 m, vii–x.1932–1936 (*Maller* and others) (USNM: 3 ♂); 6 ♂, Sta Catarina, hills between Hansa and Jaragua, 400 m, v, vii.1935 (*Maller*); 1 ♂, Sta Catarina, Rio Vermelho, 820 m, vi.1936 (*Maller*); 1 ♀, São Paulo, Paranapanema (USNM); 1 ♂, Rio; 1 ♂, Rio de Janeiro, Organ Mts, near Tajuca (*Wagner*); 1 ♂, Rio de Janeiro; 2 ♂, Rio State, Itatiaia, Lago Azul, 800 m, 25–27.ii, 20–22.vii.1955 (*Pearson, Albuquerque*); 4 ♂, Rio State, Itatiaia, Séde, 800 m, 14–15.ix.1952, 3–4.iv.1954 (*Oiticica, Pearson, Schwarz*); 9 ♂, Rio State, Teresópolis, Soberbo, 900 m, and Barreiro, 850 m, 11.vii.1951, 30.x–3.ix.1956, 3.i-vi.1957 (*Pearson*); 1 ♂, Petrópolis (USNM); 1 ♂, 1 ♀, Nova Friburgo (*Arp*); 1 ♀, Paraná, Castro, 950 m (*Jones*).

Viviennea dolens (Druce) **comb. n.**

(Pl. 5, figs 29–32)

Automolis dolens Druce, 1904 : 241. LECTOTYPE ♀, PARAGUAY (BMNH), here designated [examined].

Automolis dolens Druce; Strand, 1919 : 17.

Automolis dolens Druce; Hampson, 1920 : 174. [Coloured fig.]

Automolis tegulata Rothschild, 1933 : 170. LECTOTYPE ♂, BRAZIL (BMNH), here designated [examined]. **Syn. n.**

Automolis immarginata Rothschild, 1933 : 170. LECTOTYPE ♂, BRAZIL (BMNH), here designated [examined]. **Syn. n.**

Automolis tegulata aurantiaca Rothschild, 1935 : 241. Holotype ♂, BRAZIL (BMNH) [examined]. **Syn. n.**

Similar to *flavicincta* but with the following differences. Tegulae entirely yellow in type and most specimens; nearly black (except at anterior margin as in *flavicincta*) in type of *tegulata*, three of its paralectotypes, the type of *aurantiaca*, and five other specimens; intermediate between these (i.e. tegulae as for *flavicincta*, but with some yellow at apex of tegulae) in two of the paralectotypes of *tegulata*. Veins on forewing usually (including type) not so well marked with pale brown scales as in most specimens of *flavicincta*. Proximal margin of dark brown apical area of forewing much more strongly convex; distal yellow band of forewing usually (including type) extended proximally along outer margin of wing, this marginal

band indented at Cu_{1b} in type and most specimens – only three specimens lack this modification of the distal yellow band: the type and male paralectotype of *immarginata* Rothschild and a further male from Paraguay. A single male from Miñas State, Brazil, has an incomplete distal yellow band on the forewing. Both male and female genitalia appear to be indistinguishable from those of *flavicincta*.

As stated under *flavicincta*, I have chosen to retain a specific distinction between the latter and *dolens*, at least until more specimens, especially bred series, are available.

The type of ab. *flava* Rothschild (1935 : 242) has a deeper yellow coloration than in most specimens of this species. The infrasubspecific form *indefecta* Jörgensen (1932 : 52) appears from the description to resemble specimens of *zonana* Schaus in the colour-pattern of the wings, but *dolens* in the coloration of the tegulae.

Known from Paraná, São Paulo and Sta Catarina (south-eastern states of Brazil), from adjacent Paraguay and from Bolivia and Venezuela.

Material examined.

Automolis dolens Druce, lectotype ♀, Paraguay (BMNH). *Automolis tegulata* Rothschild, lectotype ♂, Brazil: São Paulo, Alto de Serra, v.1926 (*Spitz*) (BMNH). *Automolis immarginata* Rothschild, lectotype ♂, Brazil: São Paulo, Alto de Serra, v.1926 (*Spitz*) (BMNH). *Automolis tegulata aurantiaca* Rothschild, holotype ♂, Brazil: Sta Catarina, Jaragua do Sul, ix.1932 (*Hoffman*) (BMNH).

Venezuela: 6 ♂, Bolivar, Eldorado, Sta Elena, km 107 & km 125, 520 m & 1100 m, 14–17.viii.1957, 21–27.ix.1967 (*Fernández Yépez, Gelbez, Rodriguez V., Rosales*) (UCV); 2 ♂, Tachira, Sn J. de Navay, 225 m, 11.iv.1972 (*D'Ascoli, Montagne, Salcedo*) (UCV); 1 ♂, Tachira, La Morita, 300 m, 2–4.viii.1972 (*Teran, Salcedo*) (UCV); 1 ♂, 1 ♀, Bolivar, Kanarakuni, 450 m, 10.ix.1964, 3.ii.1967 (*Fernández Yépez, D'Ascoli*) (UCV). Brazil: 1 ♂, 1 ♀, Paraná, Iguassa, 21, 26.xii.1921; 1 ♂, 1 ♀, Paraná, Castro; 1 ♀, Paraná, Fernandes Pinheiro, 2600 ft, 3.iv.1910 (*Jones*); 1 ♂, 1 ♀, Minas, Uberaba; 1 ♀, São Paulo (MNHU); 1 ♀, São Paulo, Paranapanema (USNM); 9 ♂, 4 ♀, São Paulo, Alto de Serra, i–ix.1924–1936 (*Spitz*) (including 1 ♂, 1 ♀, paralectotypes of *immarginata* Rothschild and 1 ♂, 1 ♀, paralectotypes of *tegulata* Rothschild); São Paulo, Ypiranga, v–viii.1924, iv.1932 (including 3 ♂ paralectotypes of *tegulata*). Paraguay: 1 ♂ (*Kent*); 1 ♀ (*Schade*); 1 ♀, San Bernardino (*Schimpf*) (MNHU); 1 ♀, Sapucay, 22.xii.1904 (*Foster*); 1 ♂, Santa Barbara, 5.x.1926 (*Schade*); 1 ♀, Mollins, x.1925 (*Schade*) (USNM).

Viviennea zonana (Schaus) **comb. n.**

(Pl. 6, figs 33, 35, 36)

Automolis zonana Schaus, 1905 : 217. Holotype ♂, French Guiana (USNM) [examined].
Automolis zonana Schaus; Strand, 1919 : 27.
Automolis zonana Schaus; Hampson, 1920 : 174. [Coloured fig.]
Automolis zonana Schaus; Watson, 1971 : 98. [Fig. of ♂ genitalia.]

♂. Similar to *flavicincta*, but veins not marked with pale brown, and with short, digitate, yellow marking at tornus, along Cu_{1b}.

♂ genitalia. Medial carina and lateral carinae of uncus strongly developed; apex of valve with short process at outer (lateral) edge (except in one specimen from Carabaya, Peru).

♀. Not known.

Probably most easily confused with the few specimens of *dolens* in which the outer marginal connection between the distal yellow fascia and the tornal indentation has been lost. However, the yellow tornal marking is apparently never digitate in *dolens*, but is distinctly so in most specimens of *zonana*. In ab. *incompleta* Seitz (1922 : 373) the yellow tornal marking is unusually narrow. The shape of the uncus and the presence of a short tooth at the apex of the valve serve to distinguish *zonana* from both *flavicincta* and *dolens*.

Known from Colombia, French Guiana, Peru, Bolivia and western Brazil.

MATERIAL EXAMINED.

Automolis zonana Schaus, holotype ♂, FRENCH GUIANA: Maroni, St Jean (USNM).

COLOMBIA: 1 ♂, Muzo, 400–800 m (*Fassl*); 1 ♂, Villavicencio, 400 m (*Fassl*). FRENCH GUIANA: 5 ♂, Maroni River, St Laurent, vii–ix.1915 (*Le Moult* and others); 1 ♂, Maroni River, St Laurent (*Le Moult*) (USNM); 5 ♂, Maroni River, St Jean (*Le Moult*) (USNM: 1 ♂). BOLIVIA: 3 ♂, Rio Songo, 750 m (*Fassl*) (including type of ab. *incompleta* Seitz) (USNM: 1 ♂); 1 ♂, Dept. Sta Cruz, Prov. del Sara, 450 m (*Steinbach*); 1 ♂, Corvico, 1200 m (*Fassl*) (MNHU). PERU: 1 ♂, R. Huacamayo, La Union, Carabaya, 2000 ft (*Ockenden*); 1 ♂, Carabaya, Tinguri, 3400 ft, viii.1904 (*Ockenden*). BRAZIL: 1 ♂, Rio Purus, 'Hyutanahan' [probably Hyutanahã 7°40′ S, 65°46′ W] (*Klages*).

Viviennea ardesiaca (Rothschild) comb. n., stat. rev.

(Pl. 6, figs 34, 37–40; Pl. 7, figs 41, 42)

Automolis ardesiaca Rothschild, 1910*a* : 39, pl. 6, fig. 28. LECTOTYPE ♂, COSTA RICA (BMNH), here designated [examined].

Automolis schistaceus Rothschild, 1910*e* : 504. LECTOTYPE ♂, VENEZUELA (BMNH), here designated [examined]. **Syn. n.**

Automolis angulosa ardesiaca Rothschild; Seitz, 1922 : 373.

♂. Palps dark brown. Head iridescent brown and greenish blue. Patagia brown along anterior margin, otherwise yellow. Tegulae yellow anterior to costa of forewing; rest of tegulae and remainder of dorsal surface of thorax greyish brown with weak greenish blue iridescence. Sternal and pleural regions of thorax brown with greenish blue iridescence; legs similarly coloured but with weaker iridescence. Upper surface of forewing greyish brown (brownish grey – 4D2 – in fresh material); palest posteriorly, distal to basal yellow, transverse fascia; apical (distal) transverse fascia present in most specimens examined, but absent in type of *schistaceus*, its paralectotype and 14 other specimens from Venezuela; this apical fascia broadest in type of *ardesiaca* and the remaining specimens from Costa Rica – in these specimens the width of this fascia is greater than the distance between apex of wing and distal margin of the apical fascia; the basal fascia also is wider in the Costa Rican specimens. Upper surface of hindwing dark brown distally, yellow proximally. Under surface of wings as for upper surface except that brown areas are uniformly dark brown and that basal area of wing (proximal to yellow basal fascia) is dark brown anteriorly but yellow posteriorly. Dorsal surface of abdominal segment 1 yellow; 2–4 dark brown and iridescent greenish blue, 5–7 similar but grey medially (the grey area broadest on 7); 8 dark brown and iridescent greenish blue laterally, grey medially with pair of white spots on anterior margin. Ventral surface of segment 2 dark brown and iridescent bluish green with yellow medial patch at posterior margin; 3–8 similar in ground-colour, 3–6 with broad yellow medial area, 7 with small yellow medial patch, 8 unmarked.

♀. As for male, but brown, distal band of hindwing much broader than yellow, proximal band.

Forewing length: lectotype ♂ 20·5 mm; ♂ 19·0–21·0 mm; ♀ 22·0–25·0 mm.

♂ genitalia. Uncus not dilated apically, lateral carinae weak, medial carina absent or obsolescent; apex of valve with hook-shaped process.

♀ genitalia. Lamella postvaginalis broadly V-shaped, with small medial emargination; ductus bursae sclerotized at ostium only; accessory sac of corpus bursae smaller than latter; posterior margin of 7th sternite evenly concave, slightly asymmetric (see fig.).

Distinguished from the similarly patterned *griseonitens* by the paler yellow coloration; the less strongly iridescent colour of the head, thorax and abdomen, and by the lack of a dark distal edge to the basal yellow fascia. The male and female genitalia are also diagnostic.

As indicated above there is a striking dimorphism in the colour-pattern of the material from Venezuela in which 14 of the 40 examples lack the apical yellow fascia on the forewing (e.g. the type of *schistaceus*). There also appears to be some geographically related variation between Costa Rican specimens and those from South America: the former have much broader yellow fasciae on both fore- and hindwings.

The type of *Automolis schistacea* ab. *subapicalis* Rothschild (1935 : 240) is a Venezuelan specimen of *ardesiaca* with the apical yellow band present on the forewing.

The known range of this species includes Costa Rica, and the three most northwesterly South American countries: Colombia, Venezuela and Ecuador.

MATERIAL EXAMINED.

Automolis ardesiaca Rothschild, lectotype ♂, COSTA RICA: Tuis (BMNH). *Automolis schistaceus* Rothschild, lectotype ♂, VENEZUELA: San Esteban, vi.1909 (*Klages*) (BMNH).

COSTA RICA: 1 ♂ (USNM); 1 ♀, Turrialba, 24.vii.1963 (*Scullen, Bolinger*) (USNM); 1 ♂, Tuis (paralectotype of *ardesiaca*); 1 ♀, Tuis (USNM); 5 ♂, Sitio, ii, vi (USNM: 1 ♂); 3 ♂, Orosi, 1200 m (*Fassl*); 3 ♂, 1 ♀, Juan Viñas, 3500 ft, vi (*Schaus*) (USNM: 2 ♂, 1 ♀). COLOMBIA: 1 ♂, 1 ♀, Upper Rio Negro, 800 m (*Fassl*) (USNM : 1 ♂); 1 ♂, Bogota; 1 ♂, Villavicencio, 400 m (*Fassl*). VENEZUELA: 1 ♀, 1901 (*Pouillon*) (USNM); 6 ♂, 1 ♀, Esteban Valley, Las Quiguas, iii-xi, 1909–1910 (*Klages* and others) (CM : 1 ♂; USNM: 1 ♀) (including paralectotypes of *schistaceous*); 2 ♂, Tachira, Pregonero, 20.ix.1966 (*Rosales, Salcedo*) (UCV); 2 ♂, Lara, Cabudare, Terepaima, 1270 m, 1–4.xi.1956 (*Fernández Yépez, Rosales*) (UCV); 1 ♂, Carabobo, Rio Borburata, 250 m, 18–23.i.1972 (*Fernández Yépez, Salcedo*) (UCV); 1 ♂, Distrito Federal, Macizo Naiguata (*Fernández Yépez, Lichy*) (UCV); 14 ♂, 2 ♀, Aragua, Rancho Grande, 1100 m, 14.i–11.xi.1948–1967 (*Fernández Yépez, Gonzales, Perez, Romirez, Rosales, Salcedo, Duckworth, Poole, Dietz*) (UCV, USNM); 1 ♂, Miranda, Guatopo, 420 m, 27.iii.1964 (*Fernández Yépez, Rosales*) (UCV). ECUADOR: 2 ♀, Prov. los Rios, La Chiina, i–v.1893 (*de Mathan*).

Viviennea griseonitens (Rothschild) comb. n., stat. rev.

(Pl. 7, figs 43–47)

Automolis griseonitens Rothschild, 1910*a* : 45, pl. 6, fig. 27. LECTOTYPE ♂, PERU (BMNH), here designated [examined].

Automolis angulosa griseonitens Rothschild; Seitz, 1922 : 373.

♂. Palps dark brown and weakly iridescent greenish blue. Head dark brown and brilliantly iridescent greenish blue. Anterior margin of patagia as palps, rest deep yellow; tegulae deep yellow anteriorly, rest of tegulae and remaining dorsal surface of thorax dark brown and iridescent blue; legs and ventral surface of thorax dark brown and iridescent greenish blue. Base of upper surface of forewing dark brown with weak blue iridescence; antemedial fascia deep yellow; area between antemedial fascia and deep yellow apical fascia greyish brown with weak green iridescence, except at costa and narrow band bordering yellow fascia where the wing is dark brown; apical area of wing, distal to yellow apical fascia, dark brown with weak blue iridescence. Upper surface of hindwing yellow proximally, greyish brown distally with weak blue iridescence. Under surface of wings similar in pattern to upper surface except for some yellow scales at base of forewing; colour of yellow bands as for upper surface; brown areas uniformly dark brown and weakly iridescent blue. Dorsal surface of 1st abdominal segment deep yellow; 2–8 dark brown; iridescent blue from 2–6, green on 7–8. Ventral surface of abdomen dark brown and iridescent greenish blue; segment 2 with deep yellow medial spot; 3 with triangular deep yellow medial marking; 4 similar to 3 but yellow marking smaller; 5–8 without markings.

Forewing length: lectotype ♂ 22·5 mm; ♂ 20·5–23·5 mm; ♀ 25·0 mm.

♂ genitalia. Uncus strongly dilated apically, lateral carinae present, medial carina absent; saccular margin of valve with conspicuous process, apex of valve without processes; apical process of aedeagus digitate, sparsely spinose.

♀ genitalia. Lamella postvaginalis with broad U-shaped medial emargination; ductus bursae partially sclerotized; accessory sac of corpus bursae smaller than latter; posterior margin of 7th abdominal sternite with shallow emargination on each side.

Separable from *ardesiaca*, which has a similar colour-pattern, by differences in coloration (see *ardesiaca*) and by the male and female genitalia.

Known from Colombia, Ecuador, Peru and Bolivia.

MATERIAL EXAMINED.

Automolis griseonitens Rothschild, lectotype ♂, PERU: S.E., R. Inambari, La Oroya, 3100 ft, iii.1905 (*Ockenden*) (BMNH).

COLOMBIA: 1 ♂, Cundinamarca, Monterredondo, 1420 m, 30.x.1959 (*Schneble*) (ZSBS); 1 ♂, Upper Rio Negro, 800 m (*Fassl*). ECUADOR: 1 ♂, Rio Pastaza, Alpayacu, 3600 ft (*Palmer*). PERU: 1 ♂, 1 ♀, Carabaya, Santo Domingo, 6500 ft, ix.1902, i.1903 (*Ockenden*) (paralectotypes of *griseonitens*). BOLIVIA: 1 ♂, Cochabamba (*Steinbach*) (CM); 3 ♂, Rio Songo, 750 m (*Fassl*).

ORDISHIA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]
[*Ischnognatha* Felder sensu Druce, 1884 : 76. Partim.]
[*Ischnognatha* Felder sensu Druce, 1895 : 45. Partim.]
[*Automolis* Hübner sensu Blest, 1964. Partim. (Protective display and sound production.)]

Type-species: *Sphinx rutilus* Stoll, [1782] : 183, 252, pl. 382.

♂, ♀. Palp extending to near middle of clypeofrons; terminal segment minute. Head without processes. Antennae uniserrate in ♂, filiform in ♀, proximal segments with numerous long setae ventrally in ♂, 1 pair of long setae ventrally in ♀. Patagia at least partly yellow laterally; longitudinally banded. Tegulae longitudinally striped. Thorax with pale, mid-dorsal line. Tymbal organ with about 50 microtymbals. Midlegs with one pair of spurs; hindleg with two pairs of spurs. Forewing brown, with yellow postmedial fascia (the latter

nearly at right-angles to costal margin of wing); veins marked with yellow or pale brown scales proximal to yellow fascia in all species and distal to yellow fascia in all except *klages* and *albofasciata*; venation as in *Viviennea* (q.v.). Hindwing entirely brown (*fafner* and *cingulata*), yellow with broad, brown margins (*rutila* and *godmani*), brown but sparsely scaled proximally (*albofasciata*), or brown with white subbasal marking (*klagesi*); venation as in *Viviennea* but *Sc* reaches margin of wing except in *klagesi* and *albofasciata*. Abdomen brown, or brown with weak blue iridescence, and with broad, yellow lateral band on each side and on ventral surface.

♂ genitalia [♂ *cingulata* and *godmani* not known]. Eighth abdominal tergite with short, tapered apodemes; eighth sternite with short, broad, poorly developed apodemes. Saccus small. Valve simple; saccular margin angulate; apex of valve weakly spatulate, tapered or acuminate. Juxta well sclerotized. Apex of uncus simple or weakly bifurcate; preapical region carinate dorsally; laterally dilated and ventrally flattened, the ventral flattened area with transverse lip posteriorly. Aedeagus with or without small, single spine at apex on same side as caecum penis; vesica with large, variously scobinate lobe, and one other small but well differentiated, non-scobinate lobe on left side of aedeagus.

♀ genitalia [♀ *fafner*, *albofasciata* and *klagesi* not known]. Seventh abdominal sternite bifurcate posteriorly, emarginate medially. Lamella postvaginalis poorly developed; broadly V-shaped. Ductus bursae sclerotized along whole of its length. Corpus bursae with two small circular signa; appendix bursae arising from right posterolateral region of corpus bursae. Anterior and posterior apophyses present, the latter longer than former. Paired scent-glands well developed.

This genus shares many characters with the apparently closely related *Viviennea*. The distinguishing features are listed under *Viviennea:* most readily discernible are the longitudinally banded tegulae, the pale mid-dorsal thoracic line, the weakly iridescent terminal abdominal segment, and the absence of a proximal yellow band on the forewing, and the absence of a scent organ in the anal area of the hind wing. There are also genitalic differences (see *Viviennea*).

Of the six species now placed in *Ordishia*, two are not known from the male (*cingulata* and *godmani*), while three are not known from the female (*fafner*, *albofasciata* and *klagesi*). There are, however, sufficient external characters to justify the association of these six species in one genus. All six species have been transferred from *Automolis*.

Ordishia is known from Guatemala, Costa Rica, Panama, Ecuador, Colombia, Venezuela, Trinidad, French Guiana and Brazil.

Two species at present placed in *Rhipha* (q.v.), *persimilis* and *luteoplaga*, may not be phylogenetically distant from *Ordishia* but differ in several characters – especially the forewing shape and the incomplete yellow fascia, and the attenuation of the male genitalia. *Idalus flavoplaga* Schaus (1905 : 208) and *Rhipha flavoplagiata* Rothschild (1912 : 157) are externally similar in size, coloration and pattern to *persimilis* but are probably not congeneric with it. A new genus has been erected for another similarly patterned species, *Amphelarctia priscilla* (q.v.).

At least one species of *Ordishia* (*rutila*) is known to be aposematic and to produce the same type of protective behaviour as that described for species of *Viviennea* (q.v.). As pointed out by Blest (1964), many other species of Arctiidae and Ctenuchidae have evolved a similar forewing colour-pattern in South America and Central America and are probably members of Müllerian complexes.

Nothing is known about the early stages.

Key to Species

1	Hindwing partly yellow	2
–	Hindwing not partly yellow	3
2	Forewing apex yellow	***godmani*** (p. 29)
–	Forewing apex brown	***rutila*** (p. 27)
3	Hindwing partly white	***klagesi*** (p. 32)
–	Hindwing not partly white	4
4	Vertex of head uniformly yellow	***cingulata*** (p. 30)
–	Vertex of head yellow with brown marking or markings	5
5	Vertex of head with one brown medial marking; front uniformly yellow	***fafner*** (p. 30)
–	Vertex of head with two brown medial markings; front mostly brown	***albofasciata*** (p. 31)

Ordishia rutila (Stoll) comb. n.

(Pl. 8, figs 48–54)

Sphinx rutilus Stoll, [1782] : 183, 252, pl. 382, Type(s), probably ♀, Surinam (not traced).
Automolis rutilus (Stoll) Walker, 1856 : 1637.
Ischnognatha striata Druce, 1895 : 45. Lectotype ♂, Costa Rica (BMNH), here designated [examined].
Automolis rutila (Stoll); Hampson, 1901 : 65. (Partim). [Placement of *godmani* Druce and *striata* Druce in synonymy.]
Automolis rutila (Stoll); Strand, 1919 : 23.
Automolis rutila (Stoll; Seitz, 1922 : 375. [Description of larva.]

♂. Basal segment of palp orange ventrally, olive-brown dorsally; second segment olive-brown, becoming yellowish grey anteriorly and posteriorly; distal segment olive-brown. Front of head orange, with circular medial patch of yellowish grey bordered by olive-brown; vertex orange with two dark greyish brown medial patches. Shaft of antenna dark greyish brown; scape as shaft dorsally, but yellowish grey ventrally. Patagia orange laterally, with single greyish brown anterior spot, then striped with four longitudinal bands – alternately yellowish brown and greyish yellow. Tegulae yellowish brown with three longitudinal bands of greyish yellow – two marginal (lateral) bands and one central band. Rest of thorax yellowish brown dorsally, with greyish yellow longitudinal band medially, and greyish yellow ventrally. Front surface of fore-coxa orange, with central, yellowish brown patch; fore trochanter, femur, tibia and tarsus yellowish brown with greyish yellow outer edge; mid-coxa greyish yellow with some orange distally; trochanter, femur and tibia yellowish brown edged along inner and outer surface with greyish yellow; mid-tarsus yellowish brown; hind coxa, trochanter and femur as for mid-leg; hind tibia and tarsus yellowish brown. Upper surface of forewing yellowish brown, the veins (including fold of M and Cu_2) marked with yellowish orange; sub-apical oblique band yellowish orange, becoming deep yellow at costa. Upper surface of hindwing deep yellow at base, with broad marginal area of greyish brown. Under surface of wings as for upper surface, but ground-colour of forewing less yellowish and unmarked. Dorsal surface of abdominal segments 1 and 2 yellowish brown, with yellowish grey medial band; 3–7 greyish brown with faint dark blue iridescence, and with deep yellow lateral band (broadest posteriorly); segment 8 greyish brown, palest posteriorly; ventral surface of 2–7 deep yellow; segment 8 as for upper surface but with pair of deep yellow, oblique medial markings.

♀. Similar to ♂ but with following differences. Antennae filiform, proximal segments each with single pair of long setae, distal segments with two pairs of long setae. Yellow basal area of hindwing smaller relative to greyish brown margin of wing. Ventral surface of abdominal segments 2–6 edged laterally with dark greyish brown, 7 uniformly dark greyish brown.

Forewing length: ♂ 18·0–20·5 mm; ♀ 21·0–26·0 mm.

♂ genitalia. Uncus weakly bifurcate apically, dorsal carina continuous anteriorly with mid-dorsal swelling on tegumen; apex of valve spatulate; aedeagus usually with small, acuminate process near apex.

♀ genitalia. Posterior margin of 7th sternite deeply emarginate medially; lamella postvaginalis broadly V-shaped; ductus bursae rugose posteriorly, especially strongly so near middle of ductus.

Distinguished from its close relatives, *godmani*, *fafner* and *cingulata* by the colour-pattern of the wings. In *godmani* the whole of the forewing apical area is yellow, and in *cingulata* and *fafner* the hindwings are uniformly brown.

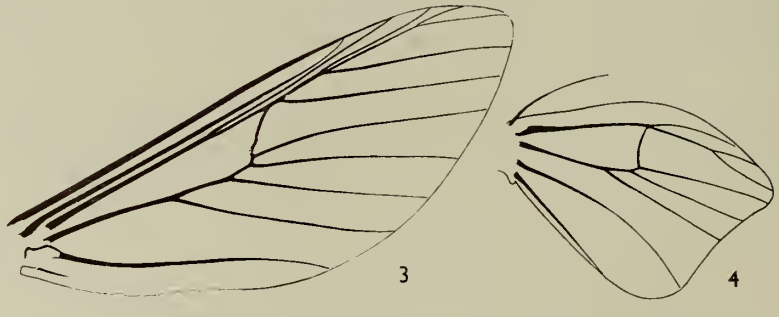
Seitz (1922 : 375) describes the larva as black, and like a *Halisidota* larva, with no hair bundles but with yellowish white hair pencils anteriorly and posteriorly; the food plant is recorded as a guava, *Psidium pyriferum* (Myrtaceae).

Known from Guatemala, Costa Rica, Colombia, Peru, Venezuela, Trinidad, French Guiana, Guyana and Brazil.

MATERIAL EXAMINED.

Ischnognatha striata Druce, lectotype ♂, COSTA RICA: Candelaria Mts (*Underwood*) (BMNH).

COSTA RICA: 1 ♀; 2 ♀. Sitio (USNM: 1 ♂); 1 ♀, Sixola River (USNM); 1 ♀, Tuis (USNM); 1 ♀, Juan Viñas (USNM); 1 ♀ Turrialba, 2–5.x.1967 (*Todd*); 1 ♀, La Florida, 500 ft, vii.1907 (USNM). GUATEMALA: 3 ♀, Cayuga, vi–x (USNM: 2 ♀). COLOMBIA: 1 ♂, Dagua River (*Rosenberg*), 6 ♂, Muzo, 400–800 m (*Fassl*) (USNM: 1 ♂). PERU: 1 ♂, Carabaya, 6000 ft, xii.1901 (*Ockenden*). VENEZUELA: 1 ♂ (*Schaus*); 1 ♂, Las Cruces Colon, 250–750 ft, 27.xii.1929 (*Roberts*); 1 ♀, Valera, i. (*Pittier*) (USNM); 1 ♂, Yarucay, Yumare, 12–13.ii.1970 (*Salcedo*) (UCV); 1 ♂, Lara, Cabudare, Terepaima, 1–4.xi.1956, 1270 m (*Fernández Yépez, Rosales*) (UCV); 1 ♂, Barinas, Reserva Forestal Ticoporo, 230 m, 26–29.iii.1968 (*Fernández Yépez, Rosales*) (UCV); 2 ♂, 6 ♀, Aragua, Rancho Grande, 1100 m, i–xii.1953–1969 (*Fernández Yépez, Kern, Rosales, Salcedo*) (UCV) (*Poole, Duckworth, Dierl*) (USNM: 1 ♂, 1 ♀); 1 ♂, Aragua, Maracay, 450 m, 25.x.1958 (*Torres*) (UCV); 1 ♀, Aroa (USNM); 2 ♀, Valencia; 1 ♂, 3 ♀, Caracas; 1 ♂, Aragua, Maracay, Choroni km 25, 1500 m, 27.v.1955 (*Fernández Yépez, Rosales*) (UCV); 1 ♂, 2 ♀, San Esteban, vii.1909 (*Klages*); 7 ♂, Las Quiguas (*Klages*); 1 ♀ Carabobo, Esteban Valley, Las Quiguas, xi–10.iii; 2 ♀, Carabobo, Rio Borburata, 250 m, 8.iv.1950, 18–23.1972 (*Fernández Yépez, Salcedo*) (UCV); 3 ♂, Bolivar, El Dorado, Sta Elena km 107, 520 m, 23.viii.1957 (*Fernández Yépez, Rosales*) (UCV); 2 ♂, Amacuro, Caño Guayo, 5.i.1961 (*Lichy, Perez*) (UCV). TRINIDAD: 2 ♂, Curepe, iii, ix.1969 (*Cruttwell*). FRENCH GUIANA: 1 ♀, Maroni,



FIGS 3, 4. *Ordishia rutila*, ♂, venation. 3, forewing; 4, hindwing.

1899–1901 (*Le Moult*); 3 ♂, 2 ♀, Maroni River, St Laurent, vii-xi; 1 ♀, Maroni River, St Jean (*Le Moult*); 1 ♀, Nouveau Chantier, vii (*Le Moult*). GUYANA: 1 ♂. BRAZIL: 2 ♂, Pará (*Moss*); 1 ♀, Amazonas, Teffé, ix.1907 (*de Mathan*).

Ordishia godmani (Druce) comb. n.

(Pl. 9, figs 55–57)

Ischnognatha godmani Druce, 1884 : 76, pl. 9, fig. 1. LECTOTYPE ♀, PANAMA (BMNH), here designated [examined].
Automolis godmani (Druce); Strand, 1919 : 18. (Partim).
Automolis godmani (Druce); Seitz, 1922 : 375. (Partim).

♀. Palp yellowish brown, edged with orange-yellow on front surface of basal segment and with greyish yellow on second segment. Head orange-yellow with medial, greyish brown spot on front. Scape of antenna greyish yellow, shaft greyish brown. Patagia orange-yellow laterally and anteriorly, each with lateral yellowish brown spot edged with greyish yellow; medial half striped longitudinally with three bands of greyish yellow alternating with two bands of yellowish brown. Tegulae yellowish brown; with longitudinal band of greyish yellow at lateral and medial edges, and in middle; further transverse greyish yellow band near anterior margin, anterior to which each tegula is greyish brown. Rest of thorax damaged dorsally, but evidence of greyish yellow longitudinal band medially; ventrally orange-yellow anteriorly, otherwise brown. Fore-coxa orange-yellow with a few yellowish brown scales anteriorly at base; trochanter yellowish brown, femur yellowish brown, with greyish yellow longitudinal strip on front and rear surfaces; tibia yellowish brown on inner surface, greyish yellow on outer surface; tarsus yellowish brown except for greyish yellow outer surface of proximal segment. Mid-coxa greyish yellow; rest of leg yellowish brown, with greyish yellow on outer surface of trochanter, femur, tibia and proximal two segments of tarsus, and along inner surface of mid-femur and tibia; hindleg similar to midleg, but tibia with greyish yellow on outer surface and with greyish yellow areas of femur much broader. Wings as for *rutila*, but yellow apical band of forewing extends distally to apex. Dorsal surface of abdominal segments 1 and 2 dark greyish brown; 3–6 dark greyish brown medially, orange-yellow laterally; 7 dark greyish brown. Ventral surface of abdomen orange-yellow.

Forewing length: lectotype ♀ 24·5 mm.

♀ genitalia as in figure. The single example examined differs little from specimens of *rutila* in genitalic characters.

♂. Not known.

Separable from *rutila* by the colour-pattern of the forewing and by the absence of markings on the vertex of the head.

Rothschild (1909 : 43) was the first to realize Hampson's (1901 : 65) error in placing *godmani* in the synonymy of *rutila*. Seitz (1922 : 375) followed Strand (1919 : 18) in wrongly placing *striata* (a junior synonym of *rutila*) in the synonymy of *godmani*.

MATERIAL EXAMINED.

Ischnognatha godmani Druce, lectotype ♀, PANAMA: Bugaba, 800–1500 ft (*Champion*) (BMNH).

Ordishia cingulata (Rothschild) **comb. n.**

(Pl. 9, figs 58–60)

Automolis cingulata Rothschild, 1910*a* : 43, pl. 6, fig. 24. LECTOTYPE ♀, Ecuador (BMNH), here designated [examined].
Automolis cingulata Rothschild, Strand, 1919 : 15.
Automolis cingulata Rothschild; Seitz, 1922 : 375.

♀. Palps yellowish brown, edged anteriorly with deep yellow; head uniformly deep yellow; scape of antenna deep yellow, shaft yellowish brown. Patagia deep yellow, each with greyish brown anterolateral spot and greyish brown posteromedial patch – the latter with greyish yellow, longitudinal band in middle; tegulae greyish brown, each with short transverse yellow bar near anterior margin; with central longitudinal band (deep yellow anteriorly, greyish yellow posteriorly), and edged on both sides with greyish yellow. Rest of thorax yellowish brown dorsally, with medial, longitudinal greyish yellow band; ventrally deep yellow anteriorly, becoming greyish brown posteriorly. Forecoxa deep yellow, rest of leg yellowish brown, edged on outer surface with greyish yellow; midcoxa greyish brown with some yellow on front surface, mid-trochanter pale yellow, rest of leg yellowish brown, with greyish yellow on front surface of each segment and on rear surface of femur; hind coxa, trochanter and femur as for midleg; hind tibia mostly yellowish brown, but with greyish yellow front surface to proximal third of tibia; inner surface of hind tarsus almost entirely greyish yellow; outer surface of each segment yellowish brown distally, greyish yellow proximally; rest of tarsus yellowish brown. Coloration of upper surface of forewing as for *rutila*; under surface also similar, but with veins faintly marked with pale yellowish brown; both surfaces of hindwing uniformly greyish brown. Upper surface of abdominal segment 1 and 2 greyish brown; 3–6 orange-yellow, with greyish brown dorsally on 3 and 4, and on anterior margin of 5 (this area broad in 3, tapering to 5); segment 7 greyish brown; ventral surface of 2–6 orange-yellow medially, greyish brown laterally; segment 7 greyish brown ventrally.

Forewing length: lectotype ♀ 22·0 mm, paralectotype ♀ 22·0 mm.

♀ genitalia. Similar to those of *rutila*, but ductus bursae narrower, and only slightly rugose near middle which is noticeably more strongly constricted than in *rutila*.

♂. Not known.

Readily separable from *rutila* by the unicolorous yellow head, the differently patterned patagia and by the uniformly brown hindwings. Distinguished from *fafner* by the coloration of the head, forecoxae, patagia and tegulae.

It can be predicted that the males of *cingulata* will prove to have a narrower yellow fascia on the forewing than the females, as in *rutila*.

Material examined.

Automolis cingulata Rothschild, lectotype ♀, Ecuador: W., Quevedo (*v. Buchwald*) (BMNH).

Ecuador: W., 1 ♀, Quevedo (*v. Buchwald*) (paralectotype).

Ordishia fafner (Schaus) **comb. n.**

Automolis fafner Schaus, 1933 : 570. Holotype ♂, Colombia (USNM) [examined].
Automolis fafner Schaus; Watson, 1971 : 32. [Fig. of ♂ genitalia.]

♂. Basal segment of palp orange ventrally, olive-brown dorsally; front surface of second segment yellow, rest olive-brown; apical segment olive-brown. Front of head orange; vertex orange with single, dark brown, medial spot. Antennal scape yellowish brown anteriorly,

orange posteriorly; rest of antenna yellowish brown. Patagia orange laterally with small yellowish brown patch at anterolateral corner, greyish yellow medially, edged posteriorly with yellowish brown (rather worn in type). Tegulae yellowish brown edged laterally and medially with greyish yellow; with central, longitudinal, greyish yellow stripe; and with yellowish brown, anterolateral area surrounded by greyish yellow; rest of dorsal surface of thorax yellowish brown, with greyish yellow mid-dorsal line; ventral and lateral surfaces of thorax greyish yellow and yellowish brown. Inner (medial) surface of forecoxa yellowish brown, front surface yellowish brown with short, orange streak medially at base and orange along lateral edge; outer surface orange; rest of foreleg yellowish brown, edged on outer surface with greyish yellow. Coxa of midleg greyish yellow with some yellowish brown distally; trochanter yellowish brown on inner surface, greyish yellow on outer surface; front surface of forefemur yellowish brown edged laterally and medially with greyish yellow; rest of midleg yellowish brown on outer surface, greyish yellow on inner surface. Hindcoxa and trochanter as midleg; hind femur yellowish brown; hind tibia and tarsus as midleg. Coloration of wings as for *cingulata*, but oblique postmedial fascia on forewing orange-yellow. Dorsal surface of abdomen black on segments 1 and 2 ; 3–7 orange laterally, black dorsally (black area tapering from 3 to 7); 8 black with dark greyish brown posterolateral tufts; abdomen orange-yellow ventrally with dark greyish brown lateral band on each side meeting on posterior border of 7; segment 8 dark greyish brown.

♂ genitalia (see Watson, 1971). Apparently indistinguishable from those of *rutila*.

Forewing length: holotype ♂ 21·0 mm.

Separable from *cingulata* by the presence of a brown marking on the head, differently coloured fore-coxae, and by differences in the coloration and colour-pattern of the patagia and tegulae. Known only from the type.

MATERIAL EXAMINED.

Automolis fafner Schaus, holotype ♂, COLOMBIA: Buena Vista (USNM).

Ordishia albofasciata (Rothschild) **comb. n.**

(Pl. 10, figs 64–66)

Automolis albofasciata Rothschild, 1922 : 477. LECTOTYPE ♂, BRAZIL (BMNH), here designated [examined].

♂. Palps mainly yellowish brown, but front surface of basal segment yellow and front of second segment light yellow. Front of head yellowish brown edged laterally with few deep yellow scales; vertex deep yellow with two dark greyish brown medial spots, the larger spot placed anteriorly. Patagium deep yellow along anterior margin and at anterolateral corner and along lateral margin; medial edge yellow; rest of patagium raw umber (dark yellow-brown) with central, pale yellow, longitudinal stripe. Tegula raw umber edged laterally and medially with pale yellow; with narrow, central, yellow, longitudinal strip and with pale yellow, anterolateral corner crossed by transverse band of raw umber. Rest of dorsal surface of thorax raw umber, with pale yellow, medial, longitudinal line; ventrally pale yellow and yellowish brown. Foreleg coxa yellowish brown with orange-yellow patch proximally on front surface and deep yellow on outer surface; trochanter yellowish brown on inner surface, pale yellow on outer surface; femur yellowish brown, but pale yellow along rear surface and in narrow band along front surface; tibia and tarsus uniformly yellowish brown. Midleg as for foreleg, but coxa pale yellowish brown and pale yellow. Hindleg similar to midleg, but front surface yellow, and tibia with pale yellow, longitudinal streak on proximal part of outer surface. Upper surface of forewing raw umber, with yellowish white, oblique band distally and veins marked with light greyish yellow proximal to oblique band; hindwing greyish brown, palest

proximally where wing is sparsely scaled. Under surface of wings as for upper surface, but forewing veins unmarked. Abdominal segment 1 raw umber dorsally; segment 2 raw umber with weak, dark blue iridescence; 3–6 as for 2, but deep yellow laterally; 7 laterally deep yellow, medially iridescent raw umber and dark blue anteriorly, and yellowish grey posteriorly; 8 as for 7 but without yellow laterally. Ventral surface of abdomen deep yellow with iridescent raw umber and dark blue lateral bands on 2–7, these bands meeting along posterior margin of segment 8.

Forewing length: holotype ♂ 18·5 mm; paratypes 18·0–19·0 mm.

♂ genitalia. Uncus weakly emarginate medially at apex; dorsal surface with weakly developed longitudinal carina medially. Apex of valve digitate; pre-apical part of valve flat or weakly concave on inner surface. Aedeagus with short apical spine; vesica with three lobes, the largest scobinate on one side but not at apex, the smallest without scobinations, the remaining lobe entirely scobinate.

♀. Not known.

Of the two males mentioned by Rothschild, only one can be identified as such. This had been labelled 'Type' by Rothschild and is selected as lectotype.

Distinguished from *rutila* by the yellowish white, oblique band on the forewing, the nearly unicolorous hindwing and the uniformly brown front of the head. The male genitalia differ in details of the valves, uncus and aedeagus.

MATERIAL EXAMINED.

Automolis albofasciata Rothschild, lectotype ♂, BRAZIL: Pará (*Moss*) (BMNH).

BRAZIL: 3 ♂, Pará (Moss).

Ordishia klagesi (Rothschild) **comb. n.**

(Pl. 10, figs 61–63)

Automolis klagesi Rothschild, 1910*a* : 42, pl. 5, fig. 43. Holotype ♂, BRAZIL (BMNH) [examined].
Automolis klagesi Rothschild; Strand, 1919 : 20.
Automolis clagesi Hampson, 1920 : 173. [Unjustified emendation.]
Automolis klagesi Rothschild; Seitz, 1922 : 375.

♂. Basal segment of palp with orange-yellow outer surface and dark brown inner surface; second segment yellowish grey on outer surface, dark brown as inner surface; apical segment yellowish grey. Front of head greyish yellow laterally and in area above labrum, with some yellowish white scales anterior to base of antenna, otherwise dark brown; vertex with two large, dark brown, medial patches edged with orange-yellow. Antenna dark brown except for greyish yellow patch on posterior surface of scape. Patagium dark brown, edged laterally, medially and posteriorly with yellowish white; with central, longitudinal, brownish white stripe, and with orange-yellow, anterolateral patch. Tegula dark brown, edged laterally and medially with brownish white and with brownish white longitudinal stripe in centre. Rest of dorsal surface of thorax dark brown, with brownish white, longitudinal, medial line. Ventral surface of thorax dark brown and greyish yellow. Fore coxa yellowish brown edged with orange-yellow along outer surface and at base of inner surface; trochanter yellowish brown proximally, yellowish white distally; tibia and tarsus yellowish brown, the former edged with yellowish white on front surface. Midcoxa yellowish brown and yellowish white; rest of leg as foreleg, but femur yellowish white on both front and rear surfaces. Hindleg as for midleg. Forewing dark brown dorsally, with very weak, dark blue iridescence; veins proximal to yellow, oblique band marked with greyish orange; hindwing dark brown (slightly paler than forewing)

except for sparsely scaled basal area; ventrally as for dorsal surface but slightly paler. Abdominal segment 1, 2 and 7 weakly iridescent dark brown and dark blue; 3–6 similar in colour medially, but with broad, lateral band of yellow (incomplete on 4 which has dark medial coloration continued across anterior margin of segment); ventral surface of abdomen yellow in broad medial band on segments 2–7, otherwise weakly iridescent dark brown and dark blue.

Forewing length: holotype ♂ 18·0 mm; ♂ 18·0–19·5 mm.

♂ genitalia. Apex of uncus simple, dorsal surface weakly carinate distally, somewhat globose and weakly sulcate at base; apex of valve tapered, inner surface of distal part of valve concave; aedeagus without apical spine, outer (posterior) surface of vesica scobinate except for small lobe arising on side nearest caecum penis.

♀. Not known.

Possibly most closely allied to *rothschildi*, but distinguished by the darker coloration of the thorax, wings and abdomen, the more yellowish oblique band on the forewing (this band usually somewhat tapered towards anal margin), the white patch on the hindwing and by the genitalia.

Apart from the Brazilian material listed below, there are two males from French Guiana in the BMNH collection and one in the USNM which differ from the holotype of *klagesi* in that the forecoxa has no yellow band along its inner surface, the front of the head is not edged laterally with greyish yellow, and the apex of the valve is acuminate. These three specimens may represent a new species.

MATERIAL EXAMINED.

Automolis klagesi Rothschild, holotype ♂, BRAZIL: Amazonas, Fonte Boa, v.1906 (*Klages*) (BMNH).

BRAZIL: 1 ♂, Amazonas, Codajas, iv.1907 (*Klages*); 7 ♂, Pará, iii–v.1926 [2 ex.] (*Moss*) (USNM: 1 ♂).

MELANARCTIA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]

Type-species: *Automolis ockendeni* Rothschild, 1910*a* : 40.

♂. Palp extending dorsally nearly to level of antennal base. Head without tufts or processes. Antennae bipectinate, each pectination with terminal seta equal in length to about one-third length of pectination. Tymbal organ well developed. Forewing broad distally, the distance between apex and anal angle greater than distance between wing-base and anal angle; venation as in figure; sparsely scaled area present posterior to cell on undersurface. Hind wing much produced costally, densely covered with grey scales; venation as in text-figure; upper surface with circular or ovate androconial patch near distal end of cell; under surface with adroconial patch and hair-pencil protected by anal fold (see text-figure and plate). Fore-tibia with epiphysis, mid-tibia with single pair of spurs, hind-tibia with two pairs of spurs.

♂ genitalia. Saccus shallow; valves broad, well sclerotized, tapered apically; juxta asymmetric with posteriorly directed process on either side; tegumen massive, produced laterally and ventrally to form incomplete tube around anus; uncus small, tapered, carinate laterally; vesica of aedeagus with several lobes, partly scobinate, with single group of large, thorn-like spines; eighth abdominal tergite with short, tapered apodemes; eighth sternite with shorter, rounded apodemes.

♀. Not known.

Melanarctia is possibly most closely allied to *Ordishia* which it resembles in coloration and in the colour-pattern of the forewings. However, the presence of bipectinate antennae (at least in the ♂), the forewing shape and the absence of any yellow coloration on the abdomen at once separate the genera. In the male genitalia, the highly modified tegumen and juxta of *Melanarctia* are also diagnostic.

Some species of *Epidesma* Hübner and *Loxozona* Hampson and a few other genera of Ctenuchidae closely resemble *Melanarctia* in colour-pattern but differ in genitalic and other characters and are clearly not closely related to the latter. It is probable that at least some of these species may be partners in Müllerian complexes. There are other superficially similar species in the Agaristidae, especially in the genera *Phasidia* Hampson and *Rhosus*, and in the Dioptidae (*Josia* Hübner and *Actea* Walker).

Melanarctia is known from two species, both of which have been transferred from *Automolis*.

Nothing is known about the early stages of either species.

Key to Species

1 Length of orange-yellow fascia on forewing equal to about twice its width ***lativitta*** (p. 35)
– Length of orange-yellow fascia on forewing equal to or greater than three times its width . . . . . ***ockendeni*** (p. 34)

Melanarctia ockendeni (Rothschild) **comb. n.**

(Text-figs 5, 6; Pl. 11, figs 67–69)

Automolis ockendeni Rothschild, 1910*a* : 40, pl. 5, fig. 4 [in colour]. LECTOTYPE ♂, Peru (BMNH), here designated [examined].
Automolis occendeni Hampson, 1920 : 135. [Unjustified emendation.]
Automolis ockendeni Rothschild; Seitz, 1922 : 375.

♂. Palp dark brown, with yellowish white patch on outer surface of basal segment (at distal end) and near distal end of outer surface of second segment. Clypeo-frons and vertex dark brown. Antenna bipectinate; dark brown. Thorax dark brown, darkest dorsally. Tymbal organ with about 45 microtymbals. Legs dark brown; more yellowish than thorax. Upper surface of forewing dark brown with oblique orange-yellow postmedial fascia; outer marginal fringe brown, paler than rest of wing. Upper surface of hindwing mostly dark brown, but sparsely scaled basally and in cell; yellowish brown, circular androconial patch present at distal end of cell. Under surface of forewing similar to upper surface, but paler, especially at base and anally, and with unscaled area between cell and vestige of Cu_2; hindwing dark brown, with sparsely scaled area immediately posterior to cell. Dorsal surface of abdomen weakly iridescent dark brown and dark blue; ventral surface dark yellowish brown.

Forewing length: lectotype ♂ 19·0 mm; paralectotype ♂ 17·0–18·0 mm.

♂ genitalia. Differ from those of *lativitta* apparently only in the smaller number of thorn-like spines on the vesica of the aedeagus.

♀. Not known.

This species is separable from *lativitta* by the narrower, orange-yellow fascia on the forewing and by the broader, outer marginal fringe of the forewing (see plate).

In the genitalia the thorn-like cornutal spines of the vesica are fewer in number than in *lativitta*.

Of the seven males mentioned by Rothschild in his description of *ockendeni*, only four can be traced. The lectotype was labelled 'type' by Rothschild and is the specimen figured by him in the plate accompanying his description of this species.

MATERIAL EXAMINED.

Automolis ockendeni Rothschild, lectotype ♂, PERU: Inambari River, La Oroya, 3100 ft, dry season, 1904 (*Ockenden*) (BMNH).

PERU: 3 ♂, Inambari River, La Oroya, 3100 ft, wet season iv.1905, dry season, ix.1904 (*Ockenden*); 1 ♂, Carabaya, S. Domingo, 6000 ft, wet season, ii.1902 (*Ockenden*). GUYANA: 1 ♂, Rio Potaro, Tumatumari, ii.1912 (USNM).

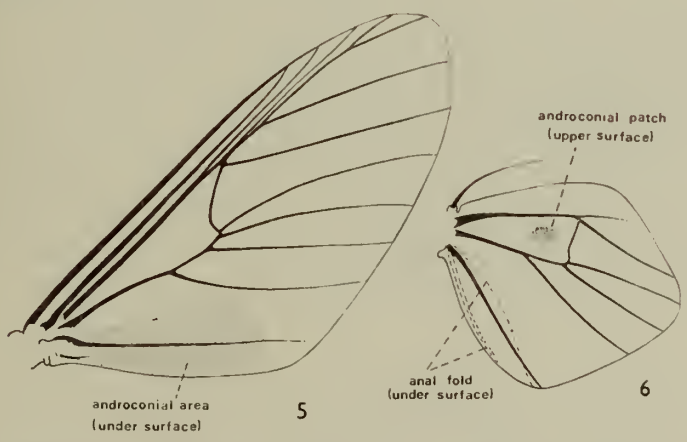
Melanarctia lativitta (Rothschild) comb. n., stat. n.

(Pl. 11, figs 70–72; Pl. 12, figs 73–77)

Automolis ockendeni lativitta Rothschild, 1910*a* : 40, pl. 5, fig. 42 [in colour]. LECTOTYPE ♂ BRAZIL (BMNH), here designated [examined].
Automolis occendeni [sic] *lativitta* Rothschild; Hampson, 1920 : 136.
Automolis ockendeni lativitta Rothschild; Seitz, 1922 : 375.

♂. Similar to *ockendeni* but orange-yellow fascia on forewing considerably broader (length equal to about twice its width, compared with three times its width in *ockendeni*), outer marginal fringe of forewing broader (1·0 mm at greatest breadth compared with 0·5 mm in *ockendeni*); and in the genitalia the thorn-like cornutal spines are greater in number (see text-figures).

♀. Not known.



FIGS 5, 6. *Melanarctia ockendeni*, ♂, venation. 5, forewing; 6, hindwing. The anal fold under the hindwing encloses a scent-organ (see Pl. 12, fig. 76 of *M. lativitta*). Scales from the androconial patch on the upper surface of the hindwing are illustrated on Pl. 12, figs 73–75, of *M. lativitta*.

The syntype figured by Rothschild and labelled 'type' by him has been selected as lectotype. The three other syntypes have been found.

MATERIAL EXAMINED.

Automolis ockendeni lativitta Rothschild, lectotype ♂, BRAZIL: Amazonas, Fonte Boa, ix.1906 (*Klages*) (BMNH).

BRAZIL: 3 ♂ paratypes, Amazonas, Fonte Boa, vi.1906, vii.1907 (*Klages*) (BMNH); 1 ♂, Amazonas, Rio Madeira, Manicore, x–xi (USNM).

HIMERARCTIA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]

Type-species: *Automolis docis* Hübner, [1831*c*] : 32.

♂. Palp extending to about middle of clypeo-frons; apical segment minute. Antennae bipectinate. Head without processes or tufts; ventral part of clypeo-frons brilliantly iridescent blue or green. Patagia and tegulae uniformly brown, or brown marked with orange or reddish orange. Metascutum, and mesoscutum (except *griseipennis*) with iridescent blue or green scales. Tymbal organ with about 50 microtymbals. Legs with iridescent blue or green markings. Midtibia with one pair of spurs; hind tibia with two pairs. Wing venation as in Text-figs 7 & 8; forewing brown, with or without orange or reddish orange markings; hindwing with yellow or orange scales in cell on both upper and under surfaces (except in few specimens of *docis* and *griseipennis*); anal area folded, enclosing scent scales and hair-pencil. Segments 1 and 2 of abdomen orange or reddish orange dorsally; posterior segments (at least 5–8) brown with iridescent blue or green patches medially and laterally; ventral surface of abdomen similar to dorsal surface, but orange or reddish orange more extensive and medial iridescent markings absent.

♀. Similar to ♂ but hindwing greater in area.

♂ genitalia. Eighth abdominal tergite and sternite with short apodemes – equal in size except in *griseipennis* in which apodemes of sternite are shorter and broader than those of tergite. Saccus small, almost obsolete. Valve broad, robust; sacculus expanded apically into broad, flattened plate; costa with arcuate, digitate, apical process; juxta with two free, posterior, digitate processes, the right-hand process spinose, the left-hand process without spines. Lateral margins of tegumen extended ventrally and curved inwards (medially), the posterior part clothed with anteriorly directed spines. Uncus sulcate dorsomedially except at slender apex. Vesica of aedeagus with several short lobes and two long lobes.

♀ genitalia. Corpus bursae with pair of ovate, weakly invaginate, scobinate signa; ductus bursae short, sclerotized; appendix bursae opening into posterior third of corpus bursae. Ductus seminalis opens into appendix bursae. Posterior margin of 7th abdominal sternite emarginate medially; lamella postvaginalis invaginate medially. Anterior apophyses short; posterior apophyses over twice as long as latter. Single pair of dorsal scent tubules opening dorsally at base of papillae anales.

There are similarities in the male genitalia between *Himerarctia* and *Melanarctia*, particularly in the shape of the tegumen and the juxta, but other characters do not suggest close affinities. The wing-shape and the colour-pattern of the abdomen of *Himerarctia* is matched in some species of *Ormetica*, but the genitalia are markedly different in several features.

The similarity in abdominal coloration suggests that *Himerarctia* species will prove to have a similar protective display pattern to that of *Ormetica*, in which

the conspicuously coloured abdomen is exposed by the partly unfolded and alternately depressed and raised wings, either as an aposematic signal, or a Batesian deception if the species of *Himerarctia* are palatable to predators.

Four species are included in this genus: two new species, *laeta* and *viridisignata*, *docis* (transferred from *Automolis*) and *griseipennis* (transferred from *Prumala*).

The distribution of *Himerarctia* includes French Guiana, Guyana, Colombia, Brazil, Bolivia and Peru.

Nothing is known about the early stages.

Key to Species

1 Iridescent markings on abdomen pale green and bluish green . . ***viridisignata*** (p. 39)
– Iridescent markings on abdomen blue and greenish blue 2
2 Upper surface of forewing without orange or reddish orange markings, but with pale brown postmedial band parallel to outer margin of wing . . ***griseipennis*** (p. 40)
– Upper surface of forewing usually with or without orange or reddish orange markings; without pale brown postmedial band 3
3 Upper surface of forewing either entirely brown, or brown with narrow orange or reddish orange band . . . . . ***docis*** (p. 37)
– Upper surface of forewing mostly orange or reddish orange . . ***laeta*** (p. 39)

Himerarctia docis (Hübner) **comb. n.**

(Text-figs 7, 8; Pl. 13, figs 78—83; Pl. 14, figs 84–88)

Automolis docis Hübner, [1831*c*], **3** : 32, figs 537, 538. Type(s), French Guiana, 'Cayenne' (probably lost).
Automolis basalis Walker, 1856 : 1635. LECTOTYPE ♀, Brazil (UM, Oxford), here designated [examined]. [Synonymized with *docis* by Hampson, 1901 : 51.]
Automolis docis Hübner; Strand, 1919 : 17.
Automolis docis Hübner; Seitz, 1922 : 372, pl. 51 f.
Automolis docis ab. *tenebrata* Seitz, 1922 : 372.

♂. Palp dark brown. Front of head dark brown dorsally, iridescent blue and greenish blue ventrally; vertex dark brown with pair of iridescent blue and greenish blue patches posterior to antennae. Antennae dark brown. Patagia dark brown with iridescent blue and greenish blue patch anterolaterally and oblique reddish orange band extending from medial margin to posterior margin of each patagium. Tegulae dark brown with oblique reddish orange band; rest of dorsal surface of thorax dark brown anteriorly (with iridescent blue and greenish blue medial patch), followed posteriorly by transverse band of reddish orange and iridescent blue and greenish blue at posterior margin. Ventral and lateral surfaces of thorax dark brown. Foreleg dark brown, becoming pale yellow at distal end of tarsus; front surface of coxa and outer surface of femur iridescent blue and greenish blue. Midleg similar to foreleg except that tarsus is almost completely pale yellow; hindleg as midleg but with line of iridescent blue and greenish blue scales along outer surface of femur. Upper surface of forewing dark brown or yellowish brown, usually with arcuate, reddish orange band extending from outer margin to near base of anal margin and with short band of same colour connecting arcuate band with costal margin of wing. Upper surface of hindwing dark brown or yellowish brown, except for cell which is orange or reddish orange becoming more yellowish proximally, or with whole of basal half of wing orange. Under surface of forewing similar to upper surface but with lighter brown outer marginal band and often with orange band absent or nearly so. Under surface of hindwing as for upper surface but coloration of cell more reddish, costal area darker brown and anal area orange. Dorsal surface of abdominal segments 1 and 2 reddish orange,

with dark brown laterally; segments 3–8 dark brown with weak, dark blue iridescence, with iridescent blue and greenish blue medial patch and lateral patch on each side of 4–8. Ventral surface of segment 2 reddish orange medially, iridescent blue and greenish blue laterally; 3–7 reddish orange with posterolateral triangular marking of iridescent blue and greenish blue; segment 7 with posterior margin of dark brown; segment 8 dark brown with blue and greenish blue patch laterally on each side.

♀. Differs from male chiefly on the under surface of the forewing which lacks the pale outer marginal band, and on the under surface of the hind-wing where the cell is either entirely dark brown or is reddish orange distally and dark brown proximally. One specimen from Bolivia (BMNH) entirely lacks reddish orange markings on the wings.

Forewing length: ♂ 21·5–25·5 mm; ♀ 24·5–27·5 mm.

♂ genitalia. Saccus small; valve with two apical processes; juxta with two posterior processes, the left process sparsely spinose, the right process densely spinose; vinculum with numerous anteriorly directed spines in band extending from dorsal surface to ventral surface; uncus small, simple, minutely scobinate, sulcate along mid-dorsal line; vesica of aedeagus with numerous lobes, one of these scobinate.

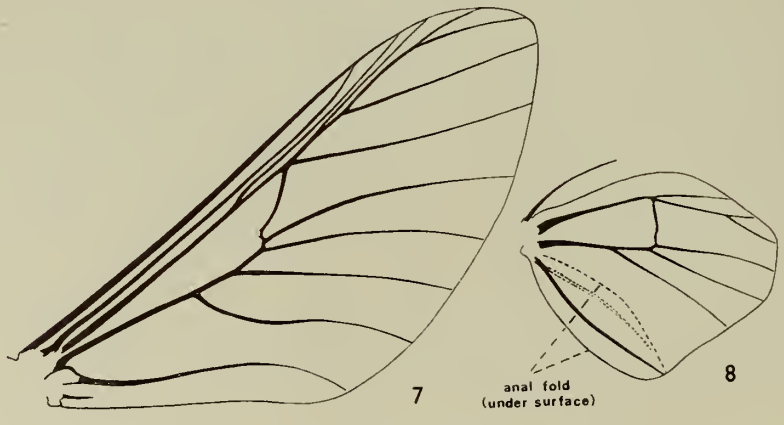
♀ genitalia. Appendix bursae opening into ventral or right-hand sides of corpus bursae.

Closely related to *viridisignata* and *laeta*. Distinguished from the former chiefly by the narrower, reddish orange (not orange) arcuate band on the forewing and the blue and greenish blue (not green and bluish green) markings on the head, thorax and abdomen. Readily separable from *laeta* by the colour-pattern of the forewing on which the orange coloration is restricted to a narrow, arcuate band and by the restriction of the orange coloration to the cell of the hindwing of most specimens.

There is little difference in genitalic characters of either sex between *docis*, *laeta* and *viridisignata*, and more specimens of the latter two species are needed before an assessment of possible distinguishing features can be made.

The name ab. *tenebrata* was given by Seitz to specimens mentioned by Rothschild (1910*a* : 42, pl. 7) in which the orange forewing band is absent or very narrow. Walker's 'var. β' (1856 : 1635) is a normal *docis* specimen; his *basalis* matches ab. *tenebrata* Seitz.

Known to occur in French Guiana, Guyana, Colombia, Brazil, Bolivia and Peru.



Figs 7, 8. *Himerarctia docis*, ♂, venation. 7, forewing; 8, hindwing. The anal fold under the hindwing encloses a scent-organ (see Pl. 13, figs 80–83).

MATERIAL EXAMINED.

Automolis basalis Walker, lectotype ♀, BRAZIL: 'Valley of the Amazon' (UM).

FRENCH GUIANA: 2 ♂, Nouveau Chantier, viii. (*Le Moult*) (USNM, 1 ♂). GUYANA: 1 ♂, 1 ♀; 1 ♀, Omai (USNM). COLOMBIA: 5 ♂, 3 ♀, Villavicencio, 400 m (*Fassl*); 1 ♂, Medina, 500 m (*Fassl*) (USNM). BRAZIL: 5 ♂, 2 ♀, Pará, Obidas, x–xi.1904 (USNM, 1 ♂). 4 ♂, 2 ♀, Pará, Itaituba to Obidas, 1878, i–iv, ix.1906 (*Hoffmanns*); 4 ♂, Amazonas, Fonte Boa, vii–ix.1906 (*Klages*); 1 ♂, Amazonas, São Paulo de Olivença, xi–xii (*Fassl*) (USNM). BOLIVIA: 2 ♀. PERU: 1 ♂, Upper Maranon, Rentema Falls, 1000 ft; 1 ♂, San Gaban, 2500 ft, iii–iv.1913.

Himerarctia viridisignata sp. n.

(Pl. 15, figs 89–93)

[*Automolis docis* Hübner sensu auct. Misidentification, partim.]

♂. Head and appendages as *docis* but iridescent patch green and bluish green. Patagia and tegulae dark brown, each with broad, oblique orange band; rest of dorsal surface of thorax dark brown, with medial patch of iridescent green and bluish green anteriorly, a transverse, orange band towards posterior margin, and posterolateral patches of green and bluish green. Legs, and ventral and lateral surfaces of thorax as *docis* except that iridescent areas of legs are green and bluish green and that single remaining hindleg of holotype lacks outer line of iridescent scales on femur. Upper surface of forewing dark brown, with orange, arcuate fascia (similar to, but broader than that of *docis*); hindwing orange, becoming reddish orange anally, with broad, distal, dark brown band and similarly coloured, narrow, costal area. Under surface of forewing as upper surface but cell area greyish yellow; hindwing as upper surface, but costal area darker than rest of brown areas and with small, dark brown marking at middle of anterior margin of cell. Dorsal surface of abdominal segment 1 and 2 reddish orange medially, dark brown and greyish yellow laterally; segments 3–8 weakly iridescent dark brown and dark blue, each with medial and two lateral patches of iridescent green and bluish green; ventral surface of segment 2 dark brown with patch of iridescent green and bluish green on each side; 3–5 orange medially, dark brown laterally; 6–7 orange anteromedially, otherwise dark brown, with iridescent green and bluish green lateral patch on each side; 8 as 6–7 but without orange.

♀. Similar to ♂, but outer marginal, dark brown band on hindwing broader, hindwing cell area on under surface dark brown proximally, and anal margin with dark brown marking near base; foretarsus entirely dark brown and mid- and hindtarsi dark brown along outer surface.

Forewing length: holotype ♂ 22·5 mm; paratype ♀ 25·5 mm.

♂ genitalia (see figure). Possibly not separable from those of *docis* or *laeta*.

♀ genitalia (see figure). Similar to those of *docis* and *laeta*.

Allied to *docis* and *laeta* but separable from both by the green and bluish green iridescent markings of the head, thorax and abdomen (see *docis*).

Holotype ♂, BRAZIL: Amazonas, Fonte Boa (*Klages*) (BMNH).

Paratype. BRAZIL: 1 ♀, Amazonas, Fonte Boa (*Klages*) (BMNH).

Himerarctia laeta sp. n.

(Pl. 16, figs 94–98)

[*Automolis docis* Hübner sensu auct. Misidentification, partim.]

Automolis docis ab. *laeta* Seitz, 1922 : 372. [An unavailable infrasubspecific name].

♂. Palps and antennae dark brown. Front of head yellowish brown ventrally, dark brown dorsally, with transverse band of iridescent blue and greenish blue in middle; vertex

dark brown, with patch of iridescent blue and greenish blue medial and posterior to each antenna. Patagia and tegulae each with broad, oblique, reddish orange or orange (holotype) band; rest of dorsal surface of thorax dark brown with broad, transverse reddish orange or orange (holotype) band towards posterior margin, and with iridescent medial patch anteriorly and on each side of medial line at posterior margin of thorax. Ventral and pleural surfaces of thorax dark brown with some iridescent blue and greenish blue scales. Forecoxa, trochanter and femur dark brown, with iridescent blue and greenish blue along front and outer (lateral) surfaces; foretibia dark brown with longitudinal band of iridescent blue and greenish blue on outer surface, adjacent to epiphysis; foretarsus dark brown proximally, pale brownish yellow distally. Midlegs and hindlegs dark brown from coxa to tibia, with iridescent blue and greenish blue on posterior surface of coxa, trochanter and femur; tarsi pale brownish yellow, with band of dark brown along front surface. Upper surface of forewing reddish orange or orange (holotype), with dark brown at base, in costal area (except at about two-thirds distance from base along costa where orange area extends to costal margin) and in outer marginal band; outer marginal fringe greyish yellow; hindwing orange, with dark brown, distal band. Under surface of forewing similar to upper surface but basal area greyish yellow posterior to costal area, and distally with broad marginal band of greyish yellow; hindwing as upper surface, but costal area dark brown and wing reddish orange anterior to posterior margin of cell and along vein 1A. Dorsal surface of abdominal segments 1 and 2 reddish orange or orange (holotype) medially, greyish yellow laterally with iridescent blue and greenish blue patch posterolaterally on 2; 3–8 weakly iridescent dark brown and dark blue with iridescent blue and greenish blue patches posterolaterally on 3–8 (largest on 7) and medially on 4–8 (largest on 5); ventral surface of segment 2 dark brown with area of iridescent blue and greenish blue laterally; 3–4 reddish orange or orange (holotype); 5–7 mainly reddish orange or orange (holotype), with posterior border of dark brown (broadest laterally) and posterolateral patch of iridescent blue and greenish blue on each side; segment 8 dark brown with pair of iridescent blue and greenish blue patches.

♀. As ♂ but fringe same colour as outer marginal band on forewing, dark brown outer marginal band of hindwing much broader, and outer marginal band on under surface of forewing narrower, dark brown in colour.

Forewing length: holotype ♂ 22·0 mm; paratypes ♂ 20·0–22·5 mm; ♀ 25·0–26·0 mm.

♂ genitalia (see figure). Similar to those of *docis* and *viridisignaata*.

♀ genitalia (see figure). Similar to those of *docis* and *viridisignaata*.

Probably most closely related to *docis* from which it is easily separated by the colour-pattern of the wings.

The name ab. *laeta* Seitz was applied to specimens illustrated by Rothschild (1910*a* : 42, pl. 7, figs 36, 41); fig. 36 illustrates the holotype of *laeta* and fig. 41 a paratype of this species.

Known only from Brazil.

Holotype ♂, Brazil: Amazonas, Santo Antonio de Javary [Javari], v.1907 (*Klages*) (BMNH).

Paratypes. Brazil: 1 ♂, Amazonas, São Paulo de Olivença, vi.1935 (*Waehner*); 1 ♀, Amazonas, Fonte Boa, vi.1906 (*Klages*); 1 ♂, Amazonas, Parintins (*Moss*); 1 ♀, Pará, Obidas, x.1935 (*Waehner*).

Himerarctia griseipennis (Rothschild) **comb. n.**

(Pl. 17, figs 99–105)

Automolis griseipennis Rothschild, 1910*a* : 41, pl. 6, fig. 7. LECTOTYPE ♂, Brazil (BMNH), here designated [examined].

Automolis griseipennis Rothschild; Strand, 1919 : 19.
Prumala griseipennis (Rothschild) Hampson, 1920 : 33.
Prumala griseipennis (Rothschild); Seitz, 1922 : 345.

♂. Palps, antennae and vertex yellowish brown; front yellowish brown dorsally, iridescent blue and greenish blue ventrally. Dorsal surface of thorax yellowish brown, except for iridescent blue and greenish blue anterolateral patch on each tegula and pair of similar patches at posterior margin of thorax; ventral and pleural surfaces darker brown than dorsal surface and with some iridescent blue and greenish blue scales laterally. Legs as *laeta* (q.v.) but brown coloration more yellowish and mid and hind tarsi pale yellow except for basal yellowish brown two-thirds. Upper surface of forewing yellowish brown, with single pale greyish yellow, postmedial fascia; the latter arcuate and quite well defined proximally, diffuse distally, extending anteriorly to apex and posteriorly to anal angle of wing; hindwing yellowish brown, with whole or most of cell light yellow in most specimens (including lectotype). Under surface of forewing yellowish brown, with weakly marked lighter brown postmedial and terminal fasciae; hindwing as upper surface but cell either orange-yellow (lectotype) or orange in those specimens where upper surface of cell is yellow and anal area orange-yellow. Dorsal surface of abdominal segments 1–4 orange-yellow (lectotype), orange or orange-red medially, dark brown laterally with iridescent blue and greenish blue patch posteriorly on each side of 3 and 4; 5–7 dark brown with medial and lateral patches of iridescent blue and greenish blue; segment 8 yellowish brown, with darker brown posterior fringe and small medial and lateral iridescent blue and greenish blue spots; ventral surface of segment 2 dark brown, with orange (lectotype) or reddish orange posteromedially and iridescent blue and greenish blue laterally; 3–6 orange (lectotype) or reddish orange with iridescent blue and greenish blue laterally; 7 orange (lectotype) or reddish orange medially, dark brown laterally with iridescent blue and greenish blue lateral spot; segment 8 dark brown with iridescent blue and greenish blue spot anterolaterally on each side.

♀. As ♂ but forewing fascia less well marked on upper surface and absent on under surface; hindwing without yellow cell markings on either surface.

Forewing length: lectotype ♂ 20·0 mm; ♂ 19·0–22·0 mm; ♀ 24·0–27·0 mm.

♂ genitalia. Similar in general structure to those of *docis* but differs in shape of juxta, valve, uncus and vesica.

♀ genitalia. Similar to those of *docis* but ductus bursae larger.

Separable from the three other species of *Himerarctia* by the presence on the forewing of a pale greyish yellow, postmedial fascia, the absence of orange or reddish orange markings on the thorax and by the ♂ genitalia.

There is some quite striking variation in the coloration of the abdomen which may be either yellowish orange or reddish orange.

Known from Brazil (Amazonas state), Colombia and Peru.

MATERIAL EXAMINED.

Automolis griseipennis Rothschild, lectotype ♂, BRAZIL: Amazonas, Fonte Boa, v.1906 (*Klages*) (BMNH).

BRAZIL: 5 ♂, 2 ♀, Amazonas, Fonte Boa, v–vii.1906 (*Klages*) (paralectotypes of *A. griseipennis* Rothschild). COLOMBIA: 4 ♂, Villavicencio, 400 m (*Fassl*). PERU: 1 ♂, Pebas, 1880 (*Mathan*); 1 ♀, Tarapoto, v–viii.1886 (*Mathan*); 1 ♀, 'La Union, R. Huacamayo, Carabaya', 2000 ft, xi.1904 (*Ockenden*).

AMPHELARCTIA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]

Type-species: *Automolis priscilla* Schaus, 1911 : 183.

♂. Palp extending to about middle of clypeo-frons; apical segment minute. Antenna uniserrate, densely setose; distal margin of proximal segments weakly concave ventrally. Head without processes or scale-tufts. Tegulae and patagia longitudinally striped. Mesothoracic tibia with two pairs of spurs. Tymbal organ present. Wings yellow and brown, without recognizable androconial patches or hair-pencils.

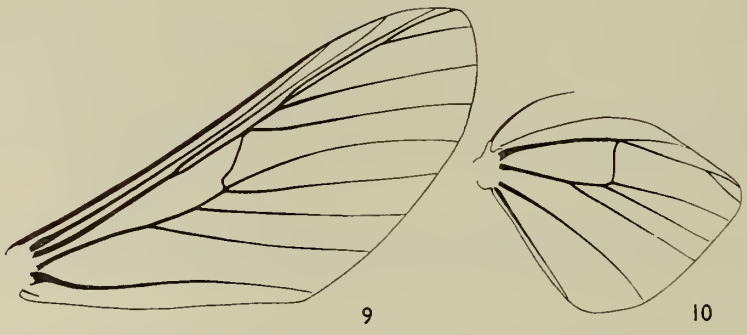
♀. Similar to ♂ but antennae less strongly serrate and hindwing relatively larger in area.

♂ genitalia. Eighth abdominal tergite and sternite with short apodemes. Saccus small. Juxta not highly modified. Valve very large, flattened, incurved apically; valves not identical to each other; tegumen small; uncus simple, tapered, weakly carinate mid-dorsally; aedeagus short; vesica partly scobinate.

♀ genitalia. Seventh abdominal sternite well sclerotized and greatly modified: deeply emarginate posteriorly and produced laterally on each side – the resultant processes presumably being engaged by the male valves during copulation. Corpus bursae with pair of scobinate signa. Appendix bursae opening into right posterolateral part of corpus bursae. Ductus seminalis opening into appendix bursae near point of origin of duct between latter and corpus bursae. Ductus bursae short, anterior part sclerotized ventrally. Lamella postvaginalis moderately well developed. Scent tubules opening dorsally at base of each papilla analis; simple, elongate. Anterior and posterior apophyses nearly equal in length.

There are several features in common between this genus and *Ordishia*, especially in the coloration and colour-pattern of the thorax. The genitalia of both sexes, however, do not indicate especially close affinities, nor does the extent of the yellow coloration of the forewings.

Rhipha persimilis (see p. 91) is similar to *Amphelarctia priscilla* in the colour-pattern of the forewing except for the more proximal placement of the postmedial yellow patch and the presence of a basal dilation of the yellow line on the vestige of Cu_2 on the upper surface of the forewing. Other similarly patterned species are *Rhipha luteoplaga*, its close ally *R. flavoplagiata* and *Idalus flavoplaga* Schaus (1905 : 208). It is probable that all four species are members of mimetic complexes. Blest (1964) had access to only one female and was not able to comment on the



FIGS 9, 10. *Amphelarctia priscilla*, ♂, venation. 9, forewing; 10, hindwing.

palatability of *priscilla*, but it did produce the same type of warning display as in those species of *Selenarctia* and *Viviennea* shown to be unpalatable by Blest.

Nothing is known about the early stages of any of the above species.

Amphelarctia priscilla (Schaus) comb. n.

(Text-figs 9, 10; Pl. 18, figs 106–110)

Automolis priscilla Schaus, 1911 : 183. Lectotype ♂, Costa Rica (BMNH), designated by Watson, 1971 :76 [examined].
Automolis priscilla Schaus; Hampson, 1920 : 171. [Fig. lacks dilated yellow mark.]
Automolis priscilla Schaus; Watson, 1971 : 76, pls 32 (type) and 130 (genitalia).
Automolis priscilla Schaus; Blest, 1964. [Protective display.]

♂. Basal segment of palp orange-yellow, middle and apical segment light yellow, with yellowish grey laterally. Front of head orange-yellow, with dark brown transverse bar in middle which extends ventrally on each side of front in some specimens; vertex orange-yellow, with small dark brown spot between antennae, and similar but larger spot posteromedially, the latter with some pale yellow scales in middle. Antenna yellowish grey laterally, pale yellow dorsally. Patagia orange-yellow, each with longitudinal yellowish brown band enclosing pale yellow band near medial margin. Tegulae orange-yellow in middle, edged laterally and medially with yellowish brown and pale yellow, with anterolateral patch of yellowish brown edged with pale yellow. Rest of dorsal surface of thorax yellowish brown, with pale yellow medial line. Ventral and pleural regions of thorax greyish yellow except for few orange-yellow scales close to head and immediately ventral to wing bases. Tymbal organ with about 60 microtymbals. Fore-coxa orange-yellow; rest of leg pale greyish yellow, except for yellowish brown band along front, outer and inner surfaces of femur, and along front surface of tibia and tarsus; mid- and hindlegs as foreleg but yellowish brown on outer surface of femur restricted to short distal streak. Wing venation as in figure. Upper surface of forewing dark brown or yellowish brown, with orange-yellow postmedial patch anteriorly and with orange-yellow vein vestiture (including vestige of Cu_2 and stem of M. Yellow line along $1A$ dilated at middle, the yellow extending to vestige of Cu_2 in some specimens (not lectotype); hindwing orange-yellow, with dark brown terminal band, the latter broadest at anal margin; not reaching apex of wing in one specimen from Peru. Under surface similar to upper surface, but forewing invariably with large, orange-yellow area extending from base distally to about two-thirds distance along anal margin and anteriorly to near posterior margin of cell. Dorsal surface of abdominal segments 1 to 4 very dark brown medially, with weak, dark blue iridescence; orange laterally; 5 to 7 orange-yellow; 8 dark grey with yellowish white medial patch and yellowish white posterior fringe; ventral surface of 2–6 orange-yellow, 7 similar but laterally with some dark grey and with long, yellowish white, posterior fringe; 8 similar to 7, but lateral, dark areas larger and posterior fringe much larger.

♀. Similar to ♂ but antennae less densely setose, hindwing relatively greater in area, dark brown terminal band of hindwing extending some distance along costal margin in the two females from Fonte Boa, and posterior segment (7) of abdomen without long posterior fringe.

Forewing length: lectotype ♂ 18·5 mm; ♂ 18·0–19·0 mm; ♀ 19·5–22·0 mm.

♂ genitalia. Apodemes of eighth tergite and sternite approximately triangular; apex of left-hand valve directed anteriorly; apex of right-hand valve directed towards medial line; middle of saccular margin of valve finely serrate, base of valve setose on inner (medial) surface; uncus weakly emarginate at apex; vesica with four main lobes, three of these scobinate.

♀ genitalia as in figure. Lamella postvaginalis narrow; weakly emarginate at middle.

Known from Costa Rica, Guatemala, Colombia, Venezuela, Trinidad, Peru and Brazil (Amazonas state).

MATERIAL EXAMINED.

Automolis priscilla Schaus, lectotype ♂, COSTA RICA: Juan Viñas, 3500 ft, vi. (USNM).

COSTA RICA: 1 ♂, Juan Viñas, vi. (USNM); 1 ♀, Sitio, v. (USNM); La Florida, 500 ft, iii.1907 (USNM); 1 ♀ (USNM). GUATEMALA: 1 ♂, 2 ♀, Cayuga, i.–viii. (USNM: 1 ♂, 2 ♀). COLOMBIA: 3 ♂, Villavicencio, 400 m (*Fassl*). VENEZUELA: 2 ♂, Aragua, Rancho Grande, 1100 m, iii.–viii. 1967 (*Poole*) (USNM). TRINIDAD: 1 ♂, Curepe, xii.1969. PERU: 1 ♂, 'La Union, R. Huacamayo, Carabaya', 2000 ft, xii.1904 (*Ockenden*). BRAZIL: 2 ♀, Amazonas, Fonte Boa, ix.–x.1906 (*Klages*); 1 ♀, Amazonas, Codajas, iv.1907 (*Klages*).

SELENARCTIA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]

Type-species: *Automolis elissa* Schaus, 1892 : 277.

♂. Palp extending upwards to less than one-third length of clypeo-frons; apical segment minute. Antennae uniserrate; each segment with transverse row of numerous fine setae. Head with raised scales between antennae; orange, with or without dark medial markings. Patagia, tegulae and rest of dorsal surface of thorax pale yellow or yellowish white; patagia with dark markings, tegulae with markings only in some specimens of *schausi;* rest of thorax with dark, medial marking in *pseudelissa* and *schausi*. Ventral surface of thorax chiefly dark brown except in *elissoides* in which it is orange. Midleg with one pair of spurs, hindleg with two pairs; fore-coxa deep orange; legs otherwise variously dark brown and yellowish white. Wing venation as in Text-figs 11, 12. Wings pale yellow or yellowish white, without markings. Outer margin of hindwing concave. Wings without recognizable scent organs. Dorsal surface of abdomen weakly iridescent dark brown and dark blue anteriorly, otherwise orange with dark medial and lateral markings; ventral surface mainly orange, with dark, lateral markings in *pseudelissa* and *schausi*.

♀. As ♂, but hindwing relatively greater in area, its outer margin less strongly concave, straight, or weakly convex; and with terminal (7th) abdominal segment iridescent dark brown and blue dorsally.

♂ genitalia. Eighth abdominal sternite and tergite with short apodemes. Saccus small or absent. Valve broad proximally; heavily sclerotized and narrower distally; its apex rounded or acuminate. Uncus with dorsal carina (best developed in *flavidorsata*); uncus flattened laterally in *pseudelissa* and *schausi*, its apex hook-shaped in these two species. Apex of aedeagus with spinose apical process in *elissa*, *flavidorsata* and *elissoides*, without such process in *pseudelissa* and *schausi*; vesica variously lobed and scobinate.

♀ genitalia. Corpus bursae with pair of small, ovate, invaginate, scobinate signa. Ductus bursae short; sclerotized for whole of its length in *elissa*, *elissoides* and *flavidorsata*; sclerotized near ostium in *schausi* and *pseudelissa*. Seventh sternite with lateral carina in *schausi* and *pseudelissa*. Lamella postvaginalis moderately well developed in *schausi* and *pseudelissa*, poorly developed in remaining species. Anterior apodemes shorter than posterior apodemes. Single pair of scent tubules opening dorsally at base of papillae anales.

Similarities in the wing shape, the coloration and the genitalia suggest affinities between this genus and *Viviennea*. However, the colour-pattern of the thorax

and abdomen, the lack of markings on the wings, and differences in the genitalia readily distinguish *Selenarctia* from *Viviennea*.

Blest (1964) has shown that *elissa* and *elissoides* are probably unpalatable to predators and that like species of *Viviennea* (p. 11) they react to tactile stimuli by raising the abdomen and alternately raising and lowering the wings. It seems likely that all the species of *Selenarctia* together with certain species of *Viviennea* and *Ormetica* (see *Viviennea*) constitute a Müllerian partnership of warningly coloured species.

Five species are known. One is described here as new, the others are transferred from *Automolis*.

Selenarctia is known from Guatemala, southwards through Central America to Colombia, Venezuela, Trinidad, Guyana, French Guiana, Brazil, Peru and Bolivia.

Nothing is known about the early stages.

Key to Species

1 Dorsal surface of thorax with dark brown medial marking 2
– Dorsal surface of thorax without markings 3
2 Medial thoracic marking a longitudinal streak, tapered posteriad; patagia unmarked ***pseudelissa*** (p. 49)
– Medial thoracic marking ovate; patagia with dark brown medial marking in some specimens . . . . . ***schausi*** (p. 49)
3 Ventral surface of thorax dark brown except in narrow band behind eyes and near base of wings 4
– Ventral surface of thorax orange . . . . . ***elissoides*** (p. 47)
4 Forewing yellowish white; genitalia as in Pl. 19 . . . . . ***elissa*** (p. 45)
– Forewing pale yellow; genitalia as in Pl. 20. . . . . ***flavidorsata*** (p. 48)

Selenarctia elissa (Schaus) comb. n.

(Text-figs 11, 12; Pl. 19, figs 111–117)

Automolis elissa Schaus, 1892 : 277. Lectotype ♀, Brazil (USNM), designated by Watson (1971 : 30) [examined].
Automolis elissa Schaus; Strand, 1919 : 17.
Automolis elissa Schaus; Seitz, 1921 : 368, pl. 50i (♀).
Automolis elissa Schaus; Blest, 1964. [Mimicry and protective display.]
Automolis elissa Schaus; Watson, 1971 : 30, pls 30c (type), 237c (genitalia).

♂. Palp black, with ventral surface of proximal segment orange and a few orange scales on ventral surface of second segment in most specimens. Head deep orange, with black, medial spot on front in type and in few other specimens. Scape of antenna orange, remainder black. Dorsal surface of thorax yellowish white (2A2); ventral surface black (with weak, dark blue iridescence) except for deep orange area bordering head and yellowish white scales bordering base of wings. Forecoxa deep orange; rest of foreleg dark brown. Midleg dark brown with some orange on inner surface of coxa in some specimens and longitudinal band of yellowish white along outer surface of forefemur in some specimens. Hindleg as midleg but seldom with markings on femur. Wings yellowish white (2A2); outer margin of hindwing

concave. Dorsal surface of abdominal segments 1 and 2 black, with weak, dark blue iridescence; 3 similar but with small area of orange posterolaterally; 4 black and dark blue medially, orange laterally, with black, anterolateral patch on each side; 5–8 orange with black, medial marking and black, lateral markings at anterior margin of each segment; ventral surface of abdomen orange tufts of yellowish white hair-scales.

♀. As ♂ but outer margin of hind wing weakly concave, straight or convex, and terminal segment of abdomen black and dark blue dorsally with orange posterior fringe.

Forewing length: lectotype ♀, 29·0 mm; ♂ 21·0–25·0 mm; ♀ 27·5–32·5 mm.

♂ genitalia. Dorsal carina of uncus poorly developed; spinose apical process of aedeagus short, not reaching margin of aedeagus when viewed laterally.

♀ genitalia as in figure.

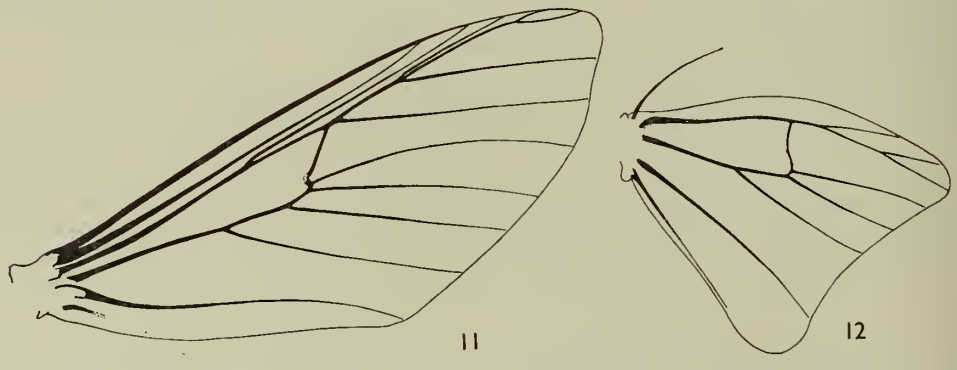
Externally most similar to *flavidorsata* from which it differs apparently only in the paler coloration of the wings and dorsal surface of the thorax. The male genitalia differ from the latter chiefly in the shape of the uncus and the apical process of the aedeagus. In the female the ductus bursae is differently sclerotized. It resembles *elissoides* in wing coloration, but differs in the coloration of the ventral surface of the thorax. A male specimen from Pará (in the BMNH) had been bred from *Clusia insignis* Martins, a species of Guttiferae.

Known from Costa Rica, Venezuela, Guyana, French Guiana, Surinam, Brazil and Bolivia.

MATERIAL EXAMINED.

Automolis elissa Schaus, lectotype ♀, BRAZIL: 'Rio Janeiro' (USNM).

COSTA RICA: 1 ♂, Juan Viñas (USNM). VENEZUELA: 1 ♂, Merida (USNM); 1 ♂, Bolivar, El Dorado, Sta Elena km 107, 520 m, 23.viii.1957 (*Fernández Yépez, Rosales*) (UCV). GUYANA: 1 ♀, Potaro River. FRENCH GUIANA: 1 ♀, 1 ♂, Oyapok River, Pied Saut, ii.1918 (*Klages*) (CM); 2 ♂, Maroni, St Jean, xi. (USNM); 1 ♀, St Laurent (USNM). SURINAM: 1 ♀, Maroewym valley, Aroewarwa Creek, vi.1905 (*Klages*) (LACM). BRAZIL: 3♂, Fonte Boa, v.1906 (*Klages*); 1 ♂ Obidos, Curumucury (*Moss*); 1 ♀, Sta Catarina, Hansa Humboldt (USNM); 1 ♀, Sta Catarina, hills between Hansa and Jaragua, 400 m, iv.1935 (*Maller*) (LACM); 1 ♂, 1 ♀, Sta Catarina (USNM: 1 ♀); 56 ♂, 6 ♀, Pará (*Moss*) (LACM: 1 ♂); 1 ♂, Rio (*Lathy*); 1 ♀, Terezopolis; 1 ♂, Rio State, Terezopolis, Barreira, 350 m, 30.x.–3.xi.1956 (*H. & G. Pearson*). BOLIVIA: 5 ♂, Rio Songo, 750 m (*Fassl*) (USNM: 1 ♂).



FIGS 11, 12. *Selenarctia elissa*, ♂, venation. 11, forewing; 12, hindwing.

Selenarctia elissoides (Rothschild) comb. n.

(Pl. 20, figs 118–121)

Automolis elissoides Rothschild, 1910*b* : 270. LECTOTYPE ♂, VENEZUELA (BMNH), here designated [examined].
Automolis elissoides Rothschild; Hampson, 1920 : 161. [Fig. of head & venation.]
Automolis elissoides Rothschild; Seitz, 1921 : 368.
Automolis elissoides Rothschild; Blest, 1964. [Mimicry and protective display.]

♂. Apical segment of palp black; second segment either entirely black (one specimen from Trinidad), or black dorsally and orange-yellow ventrally (type and most specimens); basal segment black dorsally, orange-yellow ventrally. Head deep orange, becoming paler at posterior margin. Antenna serrate, black except for orange scape; each segment with numerous setae. Patagia, tegulae and rest of dorsal surface of thorax yellowish white. Ventral surface of thorax deep orange near head, otherwise orange. Fore-coxa deep orange; trochanter orange; femur dark brown except for area of orange on outer surface at proximal end and band of yellowish white along inner surface; fore-tibia and tarsus dark brown. Coxa and trochanter of midleg orange; femur yellowish white, with area of dark brown at distal end extended as tapering band half-way along femur on inner surface; tibia and tarsus dark brown, with some yellowish white scales on outer surface of tibia (except in one specimen from Trinidad); hindleg as midleg. Wings yellowish white; outer margin of hind wing concave. Dorsal surface of abdominal segments 1–4 orange laterally, with small, dark brown spot anteriorly on 2–4, dark brown (nearly black) medially with weak dark blue iridescence; 5–8 orange, with dark brown, medial patch and lateral patch anteriorly on each segment; ventral surface of abdomen orange, with yellowish white tuft arising from lateral surface of each valve.

♀. As ♂ but outer margin of hindwing convex, straight or very weakly concave, and last (7th) segment of abdomen dark brown and weakly iridescent bluish green dorsally except for orange posterior fringe.

Forewing length: lectotype ♂ 22·5 mm; ♂ 20·0–24·0 mm; ♀ 27·0–30·5 mm.

♂ genitalia. Valve not incurved towards medial line; length of apical part of uncus about twice breadth, dorsal carina broadest and truncate posteriorly; spinose apical process of aedeagus weakly arcuate, extending beyond lateral edge of aedeagus.

♀ genitalia. Signa well developed; lamella postvaginalis weakly emarginate medially.

In wing shape and coloration this species closely resembles *elissa*, but is easily distinguished by the orange, not black, vestiture of the ventral surface of the thorax, and by the male genitalia. Similar differences in the thorax and the yellowish white wing coloration separate *elissoides* from *flavidorsata*, although the male genitalia do not differ greatly: *elissoides* has straighter valves (viewed dorsally or ventrally), a narrower uncus and a longer spinose process at the apex of the aedeagus.

Known from Guatemala, Belize, Venezuela, Trinidad, Brazil and Bolivia.

MATERIAL EXAMINED.

Automolis elissoides Rothschild, lectotype ♂, VENEZUELA: Mérida (BMNH).

GUATEMALA: 1 ♂, Cayuga; 1 ♂, 1 ♀, Cayuga, viii, ix (USNM). BELIZE: 7 ♂, Punta Gorda, vii.1933, 1934 (*White, Johnson*) (USNM: 1 ♂). VENEZUELA: 1 ♂, Mérida (*Briceno*); 1 ♂, Mérida (USNM); 1 ♂, 1 ♀, Aragua, Rancho Grande, 1100 m, 26.vii.1949, 20.ii.1967 (*Fernández Yépez, Salcedo*) (UCV); 3 ♀, Aroa (USNM); 1 ♀, Aragua, El Limon, 450, 28.x.1960 (*Fernández Yépez*) (UCV); 3 ♂, Caracas; 1 ♂, 7 ♀, Esteban Valley, Las Quiguas, xi–iii (*Klages*); 2 ♀, San Esteban, vi.1909 (*Klages*); 1 ♂, Monagas, Jusepin, 24.ix.1965 (*Fernández Yépez, Rosales*) (UCV). TRINIDAD: 2 ♂, Curepe, 23.x.1967, x.1968 (*Crutlwell*); 1 ♀, Caparo, xii.1905 (*Klages*)

[paralectotype of *elissoides*]; 1 ♀, Port of Spain, i.1897 (*Rendall*) [paralectotype of *elissoides*]; 2 ♀, Port of Spain, Belmont (*Lafond*). BRAZIL: 3 ♂, Rio; 1 ♀, Rio de Janeiro (*Foetterle*) (NM). BOLIVIA: 1 ♀, Rio Solocame, 67° W., 16° S., 1200 m, i.1901 (*Simons*).

Selenarctia flavidorsata sp. n.

(Pl. 20, figs 122, 123; Pl. 21, figs 124–126)

[*Automolis pseudelissa* Dognin sensu auct. Misidentification.]

♂. Apical segment of palp black; second segment black, with few pale yellow scales on front surface; basal segment black dorsally, deep orange ventrally. Head deep orange; front with black medial marking in few specimens (not type); vertex with small, black, medial spot at posterior margin in few specimens (not type). Scape of antenna deep orange, remainder black. Patagia, tegulae and rest of dorsal surface of thorax pale yellow (2A3). Ventral surface of thorax mostly dark brown (nearly black) except for deep orange near head and pale yellow near wing bases. Forecoxa deep orange, rest of leg dark brown. Midleg dark brown except for orange lateral patch on trochanter and pale yellow line along lateral (outer) surface of femur. Hindleg dark brown. Forewing pale yellow (2A3); hindwing slightly paler, its outer margin concave. Dorsal surface of abdominal segments 1 and 2 dark brown, nearly black (with weak, dark blue iridescence); segment 3 dark brown with narrow band of orange laterally; 4 as 3 but orange lateral area broader; 5–8 orange; 3–8 with lateral dark brown patch on each side; 6–8 with dark brown, medial patches (5 similarly marked in some specimens – not type); ventral surface orange, with some pale yellow hair-scales posteriorly on 8.

♀. As male but outer margin of hind wing convex, straight or weakly concave, and last (7th) segment of abdomen dark brown and weakly iridescent dark blue dorsally except for orange posterior fringe.

Forewing length: holotype ♂ 24·5 mm; ♂ 22·5–25·5 mm; ♀ 27·0–29·5 mm.

♂ genitalia. Valve curved inwards towards medial line; length of apical part of uncus less than twice breadth; spinose apical process of uncus arcuate, not extending beyond lateral edge of aedeagus.

♀ genitalia. Signa small; lamella postvaginalis weakly emarginate medially.

This species is externally most like *pseudelissa* from which it differs in the absence of a dark brown, medial marking on the dorsal surface of the thorax, the presence of only one row of lateral abdominal spots, and by the slightly paler yellow coloration. The ♂ genitalia most closely resemble those of *elissoides*, but the valves are distinctly arcuate (viewed ventrally), the uncus broader apically, and the apical process of the aedeagus shorter.

Known from Brazil and northern Peru.

MATERIAL EXAMINED.

Holotype ♂, BRAZIL: Sta Catarina, Hansa Humboldt, 60 m, vii.1936 (*Maller*).

Paratypes. BRAZIL: 14 ♂, 3 ♀, Sta Catarina, Hansa Humboldt, ix.1932, vi.1935, vii.1936 (*Maller*); 4 ♂, 1 ♀, Sta Catarina, hills between Hansa and Jaragua, 400., iv, v.1935 (*Maller*); 12 ♂, 2 ♀, Sta Catarina Jaragua do Sul, ix, x.1932, i, vi–viii.1935 (*Hoffmann, Maller*); 2 ♂, 2 ♀, Sta Catarina Jaragua (*Hoffmann*) (NM); 4 ♂, Sta Catarina, Joinville (ZSBS); 1 ♂, Sta Catarina, Rio Vermelho, 830 m, vi.1936 (*Maller*); 4 ♂, Sta Catarina (USNM); 1 ♂, Rio State, Terezopolis, Barreira, 350 m, 8–12.xii.1936 (*H. & G. Pearson*); 1 ♂, Rio; 1 ♂, São Paulo, Serra do Mar, ii.1927 (*Wucherpfennig*); 1 ♂, São Paulo, Ypiranga, v.1924 (*Spitz*). PERU: 1 ♂, Upper Maranon, Rentema Falls, 1000 ft (*Pratt*).

Selenarctia pseudelissa (Dognin) comb. n.

(Pl. 21, figs 127–131)

Automolis pseudelissa Dognin, 1902 : 232. Lectotype ♂, Venezuela (USNM), designated by Watson, 1971 : 77 [examined].
Automolis pseudolissa Dognin; Hampson, 1920 : 163. [Fig. of head & venation.]
Automolis pseudelissa Dognin; Watson, 1971 : 76, pls 30 (type), 127 (genitalia).

♂, ♀. Externally as for *flavidorsata* except for the generally larger size, the presence of a black and weakly iridescent, dark blue, mid-dorsal, longitudinal band on the thorax (this band broad anteriorly, tapered posteriorly), and by the presence of dark brown spots on each side of abdominal sterna 5–8 (♂) or 5–6 (♀).

Forewing length: lectotype ♂ 24·5 mm; ♂ 24·5–30·5 mm; ♀ 31·0–34·0 mm.

♂ genitalia. Uncus tapered posteriorly, very strongly carinate dorsally and with pointed, falcate apex; apex of valve acuminate and inwardly directed in most specimens (including type); aedeagus without apical process.

♀ genitalia. Lamella antevaginalis emarginate medially, lobate laterally; lamella postvaginalis with V-shaped posterior margin, lobate laterally.

Most like *schausi* externally, but separable by the absence of patagial markings and the presence of a dark, posteriorly tapered, medial band on the thorax (contrasting with a circular or ovoid patch in *schausi*). Similarities in the genitalia add weight to the possibility that *schausi* is its closest ally. Dognin's statement (1902 : 232) that *pseudelissa* differs from *elissa* in that the ventral surface of the thorax is black in *pseudelissa* but orange in *elissa* is incorrect: in fact, *elissa* does not differ from *pseudelissa* in this respect. Both *elissa* and *elissoides* are smaller, paler species neither of which possess any black markings on the dorsal surface of the thorax.

Known from Costa Rica, Colombia, Venezuela, Peru and Bolivia.

Material examined.

Automolis pseudolissa Dognin, lectotype ♂, Venezuela: Mérida (USNM).

Costa Rica: 1 ♀, Sitio, iii. (USNM). Colombia: 6 ♂, 1 ♀, Rio Negro, 8000 m (*Fassl*); 1 ♂, Pacho, 2200 (*Fassl*); 1 ♀, Rio Inambari, La Oroya, 3100 ft, ix.1904 (*Ockenden*). Venezuela: 2 ♂, 3 ♀, Mérida (USNM) [including 1 ♂ & 1 ♀ paralectotypes of *pseudolissa*]; 12 ♂, 2 ♀, Mérida (*Briceno*); 1 ♂, Trujillo, Boconó, 1200 m, 13.viii.1964 (*Osuna, Gelbes*) (UCV); 1 ♂, 1900; 1 ♀, 1901 (USNM). Peru: 33 ♂, 2 ♀, Carabaya, Santo Domingo, 6000–6500 ft, xi.1901, ii.–xii.1902, x.1903, ix.1904 (*Ockenden*) (LACM: 1 ♂); 7 ♂, 1 ♀, Carabaya (USNM). Bolivia: 4 ♂, Rio Songo, 750–800 m (*Fassl*) (USNM: 2 ♂).

Selenarctia schausi (Rothschild) comb. n.

(Pl. 22, figs 132–136)

Automolis schausi Rothschild, 1916 : 266. LECTOTYPE ♀, Costa Rica (BMNH), here designated [examined].
Automolis schausi Rothschild; Hampson, 1920 : 161. [Fig. in colour.]

♂. Apical segment of palp black; second segment black with a few yellow scales near base in one specimen; basal segment deep orange ventrally, black dorsally. Head deep orange; both vertex and front with black, medial spot. Scape of antenna orange, remainder black.

Patagia pale yellow (2A3), each with black spot posteromedially; tegulae pale yellow; rest of dorsal surface of thorax pale yellow but with large, black, medial spot anteriorly. Ventral surface of thorax dark brown (nearly black) except for deep orange immediately behind head and pale yellow near wing bases. Foreleg coxa deep orange, rest of leg dark brown; midleg dark brown except for streak of yellowish white at distal end of outer surface of femur in some specimens (not type); hindleg as midleg. Forewing pale yellow (2A3); hindwing slightly paler, its outer margin weakly concave. Dorsal surface of abdominal segments 1 and 2 dark brown (nearly black, with weak, dark blue iridescence); 3 dark brown medially, orange laterally; 4 as 3 but with narrower, dark brown area; 5–8 orange, each with dark brown, medial spot at anterior margin of segment; 3–8 with dark brown lateral spot at either side of anterior margin of each segment; ventral surface of 2 dark brown except for orange posteromedial patch; 3 orange with dark brown, lateral patch on each side; 4–8 orange, each with dark brown, lateral spot.

♀. As ♂, but outer margin of hind wing very weakly concave (type), straight or convex, and ventral surface of terminal (7th) segment of abdomen dark brown except for orange anterior area.

Forewing length: lectotype ♀ 31·0 mm; ♂ 24·5–26·0 mm; ♀ 27·5–31·0 mm.

♂ genitalia. Valves tapered, apex truncate; uncus with weak dorsal carina, strongly carinate ventrally with anteriorly directed spine at middle; aedeagus arcuate, without apical process.

♀ genitalia. Signa small; ductus bursae membranous except for narrow posterior band; lamella antevaginalis weakly emarginate medially; lamella postvaginalis strongly emarginate medially; scent tubules relatively short.

Most likely to be confused with *pseudelissa* from which it differs chiefly in the presence of a dark brown spot on each patagium and a circular or ovoid medial spot on the thorax (in contrast with a longitudinal band is *pseudelissa*). Similarities in the genitalia suggest that a close relationship exists between *schausi* and *pseudelissa*.

Known from Costa Rica and Panama.

MATERIAL EXAMINED.

Automolis schausi Rothschild, lectotype ♀, COSTA RICA: Sitio (BMNH).

COSTA RICA: 1 ♂, 2 ♀, Juan Viñas (USNM); 1 ♀, Juan Viñas, 3500 ft, vi.; 2 ♂, Tuis (USNM); 1 ♀, Sitio, iii. (USNM): 2 ♀, Irazu Volcano, Orosi, 1200 m (*Fassl, Tablitz*). PANAMA: 1 ♀, Lino.

APHYARCTIA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]

Type-species: *Automolis surinamensis* Rothschild, 1912 : 158.

♀. Palp short, extending to about one-quarter distance between labrum and base of antenna. Antenna bipectinate proximally, serrate distally. Head with conspicuous tuft extending from dorsal part of clypeo-frons to posterior margin of vertex. Thorax mostly white and orange-grey. Legs orange-red and white; mesothoracic legs with one pair of spurs; metathoracic legs with two pairs of spurs. Tymbal organ well developed; with 25 microtymbals. Wings uniformly white; venation as in figure. Abdomen white, with black, dorsal line.

♂. As ♀ but forewing narrower, and hind wing probably smaller relative to forewing [single ♂ badly damaged]. There are no recognizable scent-organs on the wings.

♀ genitalia. Corpus bursae moderate in size; appendix bursae approximately equal in size to latter. Ductus bursae sclerotized. Paired lamellae antevaginalis and single lamella postvaginalis present. Scent tubules simple, short. Papillae anales broad.

♂ genitalia. Apodemes of eighth abdominal segment absent. Saccus present. Juxta

present. Valve broad proximally with distinct saccular and costal regions. Uncus simple, arched ventrally. Aedeagus with lobate, scobinate vesica and single, basal group of cornutal spines.

The affinities of this genus are uncertain. The single known species cannot be placed satisfactorily, even tentatively, in any previously described genus. It is probably distantly related to genera such as *Selenarctia* and *Viviennea*.

Nothing is known about the early stages.

Aphyarctia surinamensis (Rothschild) **comb. n.**

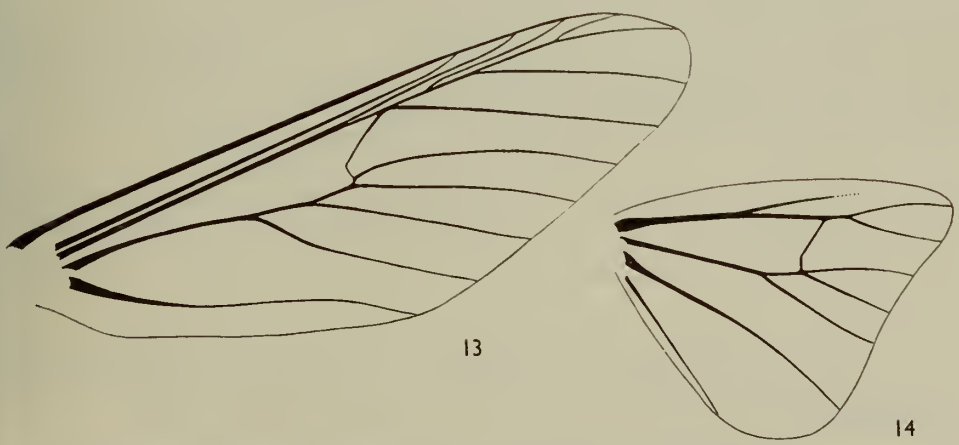
(Text-figs 13, 14; Pl. 23, figs 137–141)

Automolis surinamensis Rothschild, 1911 : 158. Holotype ♀, SURINAM (BMNH) [examined].
Automolis surinamensis Rothschild; Hampson, 1920 : 145. [Fig., too yellowish.]
Automolis surinamensis Rothschild; Seitz, 1921 : 368. [Particularly inaccurate colour-plate.]

♀. Palps white, with few reddish scales on outer (lateral) surface. Antennae white. Clypeo-frons white, with yellowish grey, transverse band at middle. Vertex covered with long, yellowish grey scales forming conspicuous, forwardly projecting tuft. Patagia white speckled with yellowish grey; posterior fringe yellowish grey. Tegulae white, speckled with yellowish grey, with transverse band of yellowish grey anteriorly and at base of posterior fringe. Rest of dorsal surface of thorax yellowish grey in anterior two-thirds, with two transverse bands of yellowish brown; posterior third white, with yellowish brown medial line. Ventral and lateral surfaces of thorax white. Coxa of prothoracic leg white; trochanter, femur and tibia orange-red on front (outer) surface, white on rear surface; foretarsus similar to tibia but rear surface greyish white. [Remaining legs missing from the type, the only ♀.] Wing venation as in figure. Forewing white; hindwing white, slightly translucent. Abdomen white except for narrow, black longitudinal, medial line along whole of dorsal surface.

♂. As ♀. Mesothoracic leg as foreleg. Metathoracic coxa, trochanter and femur white; tibia white with some yellowish brown and orange-red scales at distal end of outer surface; outer surface of tarsus yellowish brown proximally, orange-red distally, inner (medial) surface greyish white.

Forewing length: holotype ♀ 31·0 mm; ♂ 29·0 mm.



FIGS 13, 14. *Aphyarctia surinamensis*, ♂, venation. 13, forewing; 14, hindwing.

♀ genitalia. Corpus bursae with broad, scobinate area ventrally on left side and elongate signum dorsally on right side. Duct between corpus bursae and appendix bursae strongly scobinate. Ductus bursae sclerotized except for transverse area just posterior to its mid-point. Paired lamellae antevaginalis and medially emarginate lamella postvaginalis present. Posterior apophyses longer than anterior apophyses. Scent tubules tapered anteriorly.

♂ genitalia. Juxta globular. Costal region of valve terminating apically in heavily sclerotized, inwardly directed process. Uncus weakly sulcate mid-dorsally; apex acuminate, ventrally directed.

A mostly white species with a conspicuous black line along the dorsal surface of the abdomen and areas of bright orange-red on the legs.

Known only from Surinam and French Guiana.

MATERIAL EXAMINED.

Automolis surinamensis Rothschild, holotype ♀, SURINAM: Maroewym Valley, Aroewarwa Creek, vii.1905 (*Klages*) (BMNH).

FRENCH GUIANA: 1 ♂, Maroni River, St Jean, xi. (*Le Moult*) (USNM); 5 ♂, Oyapok River Pied Saut, iii.1918 (*Klages*) (CM: 4 ♂); 2 ♂, Mana River, v.1917 (CM).

EMURENA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]

Type-species: *Emurena fernandezi* sp. n.

♂, ♀. Palp extending to near middle of clypeo-frons; terminal segment minute. Head without scale-tufts. Antennae serrate in *fernandezi* and *lurida*, biserrate in remaining three species; apical segments paler in colour than rest of flagellum. Patagia mainly yellow; tegulae yellow, or yellow and grey; rest of dorsal surface of thorax yellow or grey. Tymbal organ present; with about 60 grooves in *fernandezi* and *lurida*, 50 in other three species. Mesothoracic leg with one pair of spurs; metathoracic leg with two pairs of spurs. Forewing yellow, with weakly iridescent, grey markings on upper surface; strongly marked on under surface in *tripunctata* and *quinquepunctata*, weakly marked in remaining three species. Forewing venation as in Text-fig. 15. Hindwing yellow. Male of *fernandezi* with two androconial zones: one on the greatly enlarged costal area of hindwing, the other under that part of the forewing overlapped by costal area of hindwing (Text-figs 15, 16). Males of *fernandezi*, *tripunctata* and *quinquepunctata* with hair-pencil overlying androconial scales in anal area on upper surface of hind wing. Hindwing venation modified in ♂ *fernandezi* (Text-fig. 16) to support broad costal area. Abdomen yellow.

♂ genitalia. Eighth abdominal tergite and sternite not strongly modified; each with short anterior apodemes. Saccus large. Vinculum greatly produced laterally and posteriorly in *fernandezi* and *lurida*; tegumen and posterior part of vinculum similarly produced in *tripunctata* and *quinquepunctata*. Valves relatively small except in *luridoides*; with membranous costal lobe in each species. Vesica of aedeagus scobinate in *fernandezi*; scobinate and spinose in other four species.

♀ genitalia [♀ of *lurida* and *quinquepunctata* not known]. Seventh abdominal sternite variously modified posteriorly; asymmetric in *fernandezi*. Lamella postvaginalis with medial sulcus in *fernandezi* and *luridoides*; broadly concave in *tripunctata*. Ductus bursae short; corpus bursae bearing two small, scobinate signa; appendix bursae large, its duct broad. Anterior and posterior apophyses present; short. Paired scent-organs present.

Some similarities in the coloration, wing shape and male genitalia suggest affinities

between this genus and *Sutonocrea*. The colour-pattern of the wings is, however, distinctive, and separation from *Sutonocrea* presents no difficulties.

The externally similar species *lurida* and *fernandezi* are apparently sympatric, although there is no precise locality-match in the examined material. Nearly all the so-called '*lurida*' material examined has proved to be *fernandezi*, and only four specimens of *lurida* have so far been discovered. Contrasting with the close similarity in coloration and colour-pattern between these two species is the presence in the male of *fernandezi* of an array of three scent-dispersal organs. There are two simple androconial patches, one on the under surface of the forewing, the other on the upper surface of the hindwing, both in the area of overlap of the two wings (see Text-figs 15, 16). The third androconial zone is located on the under surface of the hindwing (Text-fig. 16) in a pouch formed by the folded anal area, where it is overlaid by a posteriorly-directed hair-pencil. There are no such identifiable androconial zones in *lurida* (see comments on p. 10).

A hair-pencil is also present on the male hind wing of *tripunctata* and the closely allied allopatric *quinquepunctata*, but they lack the androconial zones on the overlapping areas of the fore- and hindwings.

The fifth species, *luridoides*, lacks both hair-pencils and androconial patches. This species stands apart from the rest of the genus in colour-pattern and male genitalic characters and is the only species to lack the curious processes of the vinculum or tegumen in the male which, at least in *fernandezi* and *tripunctata*, appear to be capable of engaging with pockets between the 7th and 8th abdominal segments of the female.

There is lateral asymmetry of the male genitalia except in *tripunctata* and *quinquepunctata*. Those of *fernandezi* and *lurida* are also bent to the right of the medial line. Matching asymmetry is present in the ostial region of the female genitalia of *fernandezi* but not of *luridoides*.

The curious nomenclatural status of *quinquepunctata* may need explanation. The species *Automolis quinquepunctata* Gaede, 1928, was subsequently independently redescribed as *Automolis quinquepunctata* Schaus, 1933. Anomalously, the latter name, therefore, is simultaneously a primary junior homonym and a junior subjective synonym of the former.

All five included species of this newly erected genus are transferred from *Automolis*.

Emurena tripunctata is known only from Costa Rica and Panama. The remaining four species are South American; their distribution includes Colombia, Venezuela, Guyana, French Guiana, Bolivia, Peru and Brazil.

Nothing is known about the early stages.

Key to Species

1 Forewing with three grey markings 2
– Forewing with more than three grey markings 4
2 Grey, medial marking of forewing at least twice as long as broad (Pl. 28, fig. 172) ***luridoides*** (p. 58)
– Grey, medial marking of forewing approximately as broad as long . . . 3

3 Grey, medial marking of forewing less than 0·5 mm from tornus at its closest point; ♂ genitalia as in Pl. 24, figs 144 & 146 . . . . . ***lurida*** (p. 56)
– Grey, medial marking of forewing separated from tornus by at least 1 mm at its closest point; ♂ genitalia as in Pl. 24, figs 145 & 147 . . ***fernandezi*** (p. 54)
4 Narrow, grey, pre-apical band present on forewing; ♂ genitalia as in Pl. 27, figs 165 & 167 . . . . . ***tripunctata*** (p. 56)
– Forewing without pre-apical band; ♂ genitalia as in Pl. 28, figs 170, 171 ***quinquepunctata*** (p. 57)

Emurena fernandezi sp. n.

(Text-figs 15, 16; Pl. 24, figs 143, 145, 147; Pl. 25, figs 148–157)

[*Automolis lurida* (Felder) sensu auct. Misidentification, partim.]

♂. Basal segment of palp orange-yellow, with greyish brown patch posterodistally; second segment greyish brown except for orange-yellow area anteriorly near base; apical segment greyish brown. Clypeo-frons iridescent blue and greyish brown; vertex orange-yellow. Antenna weakly serrate; greyish brown except apical segments which are yellowish white. Patagia orange-yellow except for narrow greyish brown lateral border; tegulae orange-yellow with iridescent blue and pastel grey, medial fringe; rest of dorsal surface of thorax iridescent blue and pastel grey, except for orange-yellow hair-scales laterally and posteriorly. Pleural and ventral surfaces of thorax orange-yellow. Tymbal organ with 58–64 grooves. Coxa and trochanter of all legs orange-yellow. Prothoracic femur orange-yellow proximally, yellowish grey distally; tibia yellowish grey, with dark greyish brown, transverse, distal band and medial bar near middle of segment, and with dark greyish brown longitudinal band along front surface; tarsal segments yellowish grey, each with greyish brown distal band. Mesothoracic femur orange-yellow, with yellowish grey on lateral (outer) surface distally; tibia as prothoracic tibia but orange yellow on medial (inner) surface; tarsus as prothoracic tibia but with yellowish grey replaced by orange-yellow on medial surface. Metathoracic femur orange-yellow; tibia orange-yellow with dark greyish brown distally on outer surface; each tarsal segment as tibia. Venation of forewing as Text-fig. 15. Upper surface of forewing orange-yellow with three iridescent blue and pastel grey patches; basal patch edged distally with dark greyish brown; medial patch edged proximally with dark greyish brown distally and white posteriorly; apical patch edged entirely with white; area of white in costal area connects basal and medial patches. Under surface of forewing orange-yellow (paler than upper surface) with unscaled area (Text-fig. 15) surrounding ovate zone of narrow androconial scales; markings of upper surface very weakly marked with greyish yellow, but with dark greyish brown costal margin to apical patch. Costal area of hind wing greatly enlarged (Text-fig. 16); supported by accessory vein. Upper surface of hindwing orange-yellow; zone of narrow androconial scales present in cell and adjacent costal area; this zone surrounded by sparsely scaled area. Under surface of hindwing orange-yellow; anal area folded to form pouch which conceals posteriorly-directed hair-pencil (Text-fig. 16) and lining of broad androconial scales. Abdomen orange-yellow.

♀. As ♂ but antenna non-serrate, outer margin of forewing weakly convex, not straight, wings without hair-pencils or identifiable groups of scent-scales, and costal area of hindwing unmodified.

Forewing length: holotype ♂ 20·0 mm; ♂ 16·5–20·5 mm; ♀ 20·0–21·5 mm.

♂ genitalia. Bilaterally asymmetric and bent towards right-hand side of medial line posteriorly. Vinculum greatly modified laterally to form two spinose, posteriorly-directed processes; that on the left much larger than process on the right. Valve with short, membranous, digitate, apical process. Uncus with two processes arising from base, that on the left with short, preapical tooth. Vesica of aedeagus multilobate, partly scobinate.

♀ genitalia. Seventh sternite asymmetric, with ostium to the left of the medial line and with

unequal pockets on either side. Duct of appendix bursae dilate and scobinate immediately before opening into corpus bursae. Lamella postvaginalis with scobinate, medial sulcus.

The asymmetry of the female genitalia matches that of the male. It can be seen from the figures that the longer left-hand process of the vinculum would fit into the large right-hand pocket of the female and the small right-hand process of the male into the small left-hand pocket of the female during copulation. The equivalent male structures in the closely related *lurida* are markedly different in shape and could be expected to function as a mechanism inhibiting cross-mating.

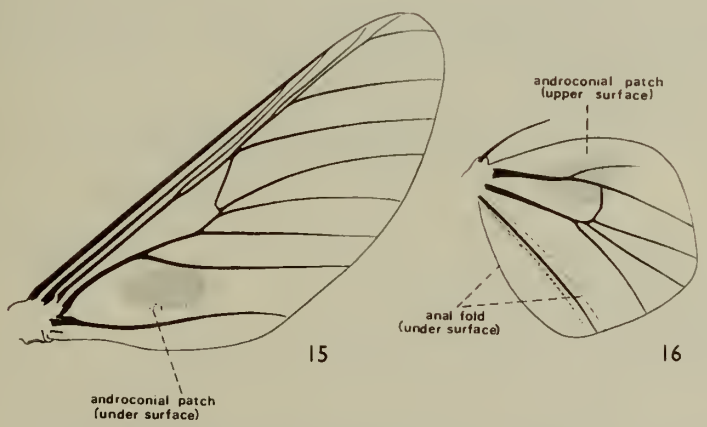
The difference in male scent-organ equipment between *fernandezi* and its sibling *lurida* has been discussed earlier (p. 53). Externally the males can also be distinguished by the position of the grey medial marking on the forewing (see Key), a characteristic which may also be useful in distinguishing females (*lurida* females have yet to be discovered).

Most of the localities given for *lurida* in the literature refer to *fernandezi*. I have examined specimens of *fernandezi* from Colombia, Venezuela, Guyana, French Guiana, Surinam, Bolivia and Brazil.

MATERIAL EXAMINED.

Holotype ♂, GUYANA: Potaro, ii.1908 (*Klages*) (BMNH).

Paratypes. COLOMBIA: 4 ♂, Rio Negro, 800 m (*Fassl*); 1 ♂, Medina (*Fassl*) (USNM). VENEZUELA: 2 ♂, 1 ♀, Bolivar, El Dorado, Sta Elena km 107, 15–17.viii.1957 (*Fernández Yépez, Rosales*) (UCV). GUYANA: 1 ♀, Potaro River, Tumatumari, iii.1912 (USNM); 11 ♂, Potaro, ii-v.1908 (*Klages*); 1 ♀, Rio Demerara; 2 ♀. SURINAM: 1 ♂. BOLIVIA: 11 ♂, Rio Songo, 750 m (*Fassl*) (USNM: 1 ♂); 2 ♂, Coroico, 1500 m (*Fassl*). BRAZIL: 7 ♂, Pará; 1 ♂, Amazonas, Espirito Santo (USNM); 1 ♂, Amazonas, São Paulo de Olivença, xi-xii (*Fassl*) (USNM); 2 ♂, Amazonas, Monte Christo (*Fassl*) (USNM); 4 ♂, Amazonas, Rio Purus, Hyutanahan, i-ii.1922 (*Klages*) (CM); 4 ♂, 1 ♀, Rio State, Terezopolis, Barreira, 350 m, 30.x–3.xi.1956, 3.i–24.ix.1957, 19–20.iv.1958 (*H. & G. Pearson*).



FIGS 15, 16. *Emurena fernandezi*, ♂, venation. 15, forewing; 16, hindwing. The scent-organ enclosed by the anal fold under the hindwing is illustrated on Pl 25, fig. 151. Scales from the androconial patch on the upper surface of the hindwing are figured on Pl. 25, figs 156, 157.

Emurena lurida (Felder) comb. n.

(Pl. 24, figs 142, 144, 146)

Eucyrta lurida Felder, 1874 : pl. 102, fig. 7 (legend). LECTOTYPE ♂, Peru (BMNH), here designated [examined].
Euplesia lurida (Felder) Kirby, 1892 : 167.
Automolis lurida (Felder) Hampson, 1901 : 45. (Partim.)
Automolis lurida (Felder); Strand, 1919 : 20. (Partim.)
Automolis lurida (Felder); Seitz, 1921 : 374, pl. 52d (inaccurate illustration of *fernandezi*). (Partim.)

There is apparently no difference in the coloration and colour-pattern between this species and *fernandezi* except on the forewing where the grey medial marking is closer to the tornus in *fernandezi* (see Key). The male differs radically from that of *fernandezi* in the absence of a hair-pencil and androconial zones (see pp. 10 and 53). The female is unknown.

Forewing length: lectotype 17·5 mm; 17·5–18·5 mm.

♂ genitalia. Asymmetric and bent to the right posteriorly. Posterior part of vinculum greatly modified to form asymmetric, setose hood dorsal to rest of genitalia; this hood bearing two posterior processes, that on the left longer and incurved. Valve with large, membranous, apical process, that on left larger than right-hand lobe. Uncus without basal processes. Vesica of aedeagus with scobinate areas and large spinose zone.

It is probable that the female of *lurida* will prove to have an outwardly-opening pocket on the right-hand side to accommodate the inwardly-directed left-hand arm of the male vinculum, comparable to the manner in which the male and female genitalia of *fernandezi* apparently interlock during copulation.

Previous references in the literature to so-called *lurida* probably refer exclusively to *fernandezi* except where BMNH and Carnegie Museum material are concerned.

Material examined.

Eucyrta lurida Felder, lectotype ♂, Peru (BMNH).

Surinam: 1 ♂, Maroewym Valley, Aroewarwa Creek, iii.1905 (*Klages*). French Guiana: 1 ♂, Mana River, v.1917 (CM); 1 ♂, Oyapok River, Pied Saut (*Klages*) (CM). Brazil: 1 ♂, Amazonas, Fonte Boa, v.1906 (*Klages*); 1 ♂, Pará (*Moss*); 1 ♂, Matto Grosso, Chapada, near Cuyaba (*Smith*) (CM); 1 ♂, Rio Purus, ii.1922 (*Klages*) (CM).

Emurena tripunctata (Druce) comb. n.

(Pl. 26, figs 158–162; Pl. 27, figs 163–167)

Sutonocrea tripunctata Druce, 1884, pl. 9, fig. 2 (good fig. but hind wing hair-pencil pouch not shown). LECTOTYPE ♂, Panama (MNHU), here designated [examined].
Automolis tripunctata (Druce) Hampson, 1901 : 56.
Automolis tripunctata (Druce); Strand, 1919 : 26.
Automolis tripunctata (Druce); Seitz, 1921 : 368, pl. 50h (poor fig.).

♂. Basal segment of palp orange-yellow; second segment black with some greyish brown scales anteriorly and with orange-yellow anterior patch at its base; apical segment yellowish grey. Clypeo-frons iridescent blue and greyish brown; vertex orange-yellow. Scape of antennae orange-yellow posteriorly, dark greyish brown anteriorly. Flagellum biserrate, densely setose; proximal three-quarters dark greyish brown; distal quarter white but with dark brown, proximal band on more proximal segments. Patagia orange-yellow with weak, pink iridescence; tegulae orange-yellow with iridescent blue and brownish grey anterolateral zone; rest of dorsal surface

of thorax orange-yellow with large, iridescent greyish brown and blue medial patch anteriorly. Pleural and ventral surfaces of thorax orange-yellow except for dark greyish brown patch behind eye. Tymbal organ with from 45 to 50 grooves. Coxa, trochanter and femur of all legs orange-yellow; femur with greyish brown distal patch edged proximally with yellowish white. Prothoracic tibia dark greyish brown with yellowish grey patch near base and at about two-thirds distance from base on front surface, with some white scales on outer surface proximally and orange-yellow scales concealing epiphysis. Prothoracic tarsus dark greyish brown, with white proximal bands on two basal segments. Inner surface of mesothoracic tibia orange-yellow, outer surface with yellowish grey proximal area bordered at base and in middle of leg with dark greyish brown and with dark greyish brown distal band edged proximally with white; tarsus as prothoracic tarsus but third segment also with white proximal band. Metathoracic tibia orange-yellow, with dark greyish brown zone at proximal and distal ends (the latter edged proximally with white); segments 1–4 of tarsus yellowish white with greyish brown terminal band to each segment; distal segment of tarsus greyish brown. Forewing venation as *fernandezi* (Text-fig. 15). Upper surface of forewing orange-yellow, with iridescent green and pastel grey basal marking and three similarly coloured, medial spots and pre-apical, oblique band. Under surface of forewing as upper surface but deeper yellow; basal marking very weakly marked except at costa; two proximal, medial markings dark brown; distal, medial marking similar, but less strongly marked; pre-apical band dark brown, most strongly marked at costa and towards outer margin of wing. Hindwing orange-yellow on both surfaces; venation as in Text-fig. 16; hair-pencil present on under surface in folded anal area, closely associated with zones of androconial scales (Pl. 26). Wings otherwise without recognizable zones of androconial scales. Abdomen orange-yellow.

♀. As ♂, but antenna less strongly biserrate, outer margin of forewing more strongly convex and anal area of hind wing unmodified.

Forewing length: ♂ 18·5–19·5 mm; ♀ 21·5 mm.

♂ genitalia. Approximately bilaterally symmetric. Valve with short, digitate, membranous, apical process. Anterior margin of tegumen produced posteriorly on either side as flat plate. Uncus with pair of large basal processes. Vesica of aedeagus with six main lobes, variously spinose or scobinate.

♀ genitalia. Corpus bursae pyriform, sclerotized anterodorsally; appendix bursae bilobate. Ostium placed to left of medial line in single available specimen (possibly distorted). Lamella postvaginalis swollen laterally; medial sulcus broad, weakly scobinate.

The species *tripunctata* is apparently unknown outside Costa Rica and Panama, unlike the remaining four species of *Emurena* which are South American. The male scent-producing hair-pencil of *tripunctata* is not therefore currently involved in species recognition functions between *Emurena* species, although there remains the possibility of a past function of this kind if the range of the related *quinquepunctata* once overlapped that of *tripunctata*.

MATERIAL EXAMINED.

Sutonocrea tripunctata Druce, lectotype ♂, PANAMA: (*Ribbe*) (MNHU).

COSTA RICA: 1 ♂, Juan Viñas, v; 2 ♂, Tuis; 1 ♂, Sitio, 4000 ft, vi; 1 ♂ Sitio (USNM); 1 ♂, Carreblanco (*Lankester*); 1 ♂, Sixola River, iii (USNM); 1 ♀, Guapiles, 850 ft (USNM).

Emurena quinquepunctata (Gaede) comb. n.

(Pl. 28, figs 168–171)

Automolis quinquepunctata Gaede, 1928 : 28. LECTOTYPE ♂, COLOMBIA (MNHU), here designated [examined].

Automolis quinquepunctata Schaus, 1933 : 568. Holotype ♂, Colombia (USNM) [examined]. [Synonymised by Watson, 1971 : 79.] [This is also a junior primary homonym of *quinquepunctata* Gaede.]

Automolis quinquepunctata Gaede; Watson, 1971 :7, pls 20d (type of *quinquepunctata*), 112a, b (genitalia).

Similar to *tripunctata* but differing in the following characters. Segment three of prothoracic tarsus with white proximal band (as segments 1 and 2). Basal marking of forewing broader posterolaterally; most anterior of three medial spots larger than other two (confluent with middle spot in one example in the USNM); pre-apical line replaced by two spots (confluent in one USNM example).

The female is unknown.

Forewing length: ♂ 19·0–20·0 mm.

♂ genitalia. Bilaterally asymmetric. Membranous apical process of valve minute. Tegumen greatly modified: dorso-anterior margin produced posteriorly to form large, laterally sclerotized hood. Uncus with two unequal basal processes. Vesica of aedeagus lobate; one lobe bearing a corona of stout spines, another lobe with patch of longer spines.

Closely allied to the Central American *tripunctata* but easily distinguished by the colour-pattern of the forewing. Known only from Colombia.

Material examined.

Automolis quinquepunctata Gaede, lectotype ♂, Colombia, between Tumaco and Pasto (*Niepelt*) (MNHU). *Automolis quinquepunctata* Schaus, holotype ♂, Colombia, Buena Vista (*Patchett*) (USNM).

Colombia: 2 ♂ (USNM).

Emurena luridoides (Rothschild)

(Pl. 28, figs 172–176)

Automolis luridoides Rothschild, 1910c : 19. [Coloured fig.] Holotype ♂, Brazil (BMNH) [examined].

Automolis luridoides Rothschild; Strand, 1919 : 20.

Automolis luridoides Rothschild; Seitz, 1921 : 374, pl. 52d (very poor fig.).

♂. Basal segment of palp orange-yellow; remainder pale grey. Clypeofrons pale grey, vertex orange-yellow. Antenna biserrate; pale grey except for white, apical 10 or 11 segments. Patagia orange-yellow with some white scales anteromedially and anterolaterally. Tegulae orange-yellow with white anterolaterally and pastel grey at extreme anterolateral angle; rest of dorsal surface of thorax weakly iridescent pale grey and pale blue medially, orange-yellow laterally and along posterior margin. Ventral and pleural regions of thorax orange-yellow except for pastel grey band between eye and tegula. Tymbal organ with between 62 and 74 microtymbals. Prothoracic coxa and trochanter orange-yellow; femur orange-yellow proximally, dark brownish grey in band just distal to middle and at distal end of femur, otherwise pale grey; tibia pale grey with dark brownish grey band at middle and at distal end and with few orange-yellow scales over epiphysis; tarsal segments pale grey with dark brownish grey distal band. Mesothoracic coxa and trochanter orange-yellow; femur orange-yellow except for distal end which is dark brownish grey, edged proximally with white. Outer surface of mesothoracic tibia pale grey with dark brownish grey band in middle and at distal end; yellowish white, longitudinal band extends along front surface; remainder of tibia orange-yellow. Mesothoracic tarsal segments pale grey with dark brownish grey, distal band. Metathoracic coxa, trochanter and femur on mesothoracic leg; tibia as femur; proximal

tarsal segment yellowish white with brownish grey distal band, remaining segments either yellowish white (e.g. type) or pale grey but invariably with brownish grey distal band. Forewing venation as *fernandezi*. $Sc + R_1$ of hindwing arises from or just distal to end of cell. Upper surface of forewing orange-yellow; markings (see plate) weakly iridescent pale blue and pale grey, edged (including costal margin in type and few other specimens) with white, and with white band connecting basal and medial markings along costa. Under surface of forewing as upper surface, but markings pale yellowish grey except in posterolateral region of basal markings and in discocellular region of medial marking. Hindwing chiefly pale yellow; orange-yellow on upper surface immediately medial (posterior) to anal vein and orange-yellow in costal area of under surface. Wings without hair-pencils on androconial zones.

♀. As male, but antennae less strongly bipectinate and outer margin of forewing more strongly convex.

Forewing length: holotype ♂ 27·0 mm; ♂ 26·0–28·5 mm; ♀ 29·0–30·0 mm.

♂ genitalia. Bilaterally asymmetric. Valve with two apical processes, one short and heavily sclerotized, the other long and membranous. Two unequal, acuminate processes at base of hood-like uncus (these processes apparently homologous with the uncus processes of the other species of *Emurena*, and without the unusual modifications of the tegumen and vinculum described for these other species). Apical area and left-hand side of vesica scobinate; long, anterodorsal lobe of vesica with row of stout spines.

♀ genitalia. Appendix bursa opening into right-hand side of posterior part of corpus bursae. Lamella postvaginalis with medial, laterally lipped, medially scobinate sulcus.

This is a distinctively marked species not likely to be confused with the other species of *Emurena*. So far known only from Brazil.

MATERIAL EXAMINED.

Automolis luridoides Rothschild, holotype ♂, BRAZIL: Minas Gerais, Preto (BMNH).

BRAZIL: 1 ♂, São Paulo (USNM); 11 ♂, 3 ♀, São Paulo, Alto do Serra i–xi.1922–1929 (*Spitz*); 2 ♂, São Paulo, Serra do Mar, iii.1927 (*Wucherpfennig*) (USNM, 1 ♂); 1 ♂, Espirito Santo [state] (USNM); 1 ♂, Bahia.

REGOBARROSIA gen. n. [Gender: feminine]

[*Automolis* Hübner sensu auct. Partim.]

Type-species: *Automolis aureogrisea* Rothschild, 1910*a* : 38.

♂. Palp curved upwards to about one-third distance from labrum to antennal base; last segment minute; greyish white. Antenna serrate, ciliate, dark in middle, yellow or yellowish white proximad and apicad. Head mostly yellow or orange. Thorax mostly yellow or orange; mesoscutellum grey and greyish white. Tymbal organ with from 47 to 50 microtymbals. Legs yellow or orange, with brown bands. Mesothoracic tibia with one pair of spurs, metathoracic tibia with two pairs of spurs. Venation of wings as in Text-figs 17 & 18. Area of overlap on under surface of forewing and upper surface of hindwing bearing zones of androconial scales: large zone under forewing; smaller zone, restricted to cell, on hindwing. Abdomen yellow or orange, with or without brown coloration dorsally.

♀ (known from two examples of *flavescens*). As male, but outer margin of hindwing with more evenly convex tornus (anal angle) and less densely setose antennae.

♂ genitalia. There are no radical differences in structure between the species of *Regobarrosia*. See description of *flavescens*. The chief diagnostic features between species are the shape and ornamentation of the vesica.

♀ genitalia. The genitalia of *flavescens* are described on page 61. The scobinate posterior lobe of the corpus bursae is an unusual feature.

Possibly closest to *Emurena* which it matches in the type of androconial patches; the yellow, brown and yellowish white coloration; and in the colour-pattern of the antennae and legs. The male genitalia of the two genera, however, have few characters in common.

There are three species in this genus: *flavescens*, known from much of tropical South America; *pseudoflavescens*, known only from Brazil (Minas Gerais state); and *aureogrisea* from eastern Peru.

Nothing is known about the early stages.

Key to Species

1 Dark marking on upper surface of forewing usually extended to middle or anterior margin of cell; segments 2–5 of metathoracic tarsus partly yellow; dorsal surface of abdomen yellow or brown 2

– Dark marking on upper surface of forewing not extended into cell; segments 2–5 of metathoracic tarsus dark brown; dorsal surface of abdomen yellow ***aureogrisea*** (p. 62)

2 Dark marking on upper surface of forewing enclosing yellow area at anal margin; dorsal surface of abdomen yellow or brown . . . . . ***flavescens*** (p. 60)

– Dark marking on upper surface of forewing not enclosing yellow area at anal margin; dorsal surface of abdomen brown except for 8th segment . ***pseudoflavescens*** (p. 62)

Regobarrosia flavescens (Walker) **comb. n.**

(Text-figs 17, 18; Pl. 29, figs 177–182; Pl. 30, figs 183–187)

Halisidota flavescens Walker, 1856 : 1705. LECTOTYPE ♂, Brazil (UM), here designated [examined].

Automolis asara Druce, 1883 : 38, pl. 40, fig. 7. LECTOTYPE ♂, Ecuador (BMNH), here designated [examined]. [Synonymized by Hampson, 1901 : 44; reinstated by Rothschild, 1910*a* : 44.] **Syn. n.**

Automolis asara Druce; Rothschild, 1910*a* : 44.

Automolis flavescens Walker; Strand, 1919 : 18.

Automolis asara Druce; Hampson, 1920 : 140.

♂. Basal segment of palp orange-yellow; second segment dark greyish brown with some yellowish white on front surface; apical segment yellowish white. Head orange-yellow with few white scales at posterolateral corners of vertex. Scape of antenna orange-yellow posteriorly, white anteriorly; proximal one-quarter to one-third of flagellum orange-yellow; apical segments of flagellum yellowish white. Dorsal surface of thorax orange-yellow, but white spot beneath each tegula and grey mesoscutellum edged posteriorly with greyish white and with greyish white mid dorsal line. Lateral and ventral surfaces of thorax orange-yellow. Tymbal organ with 47–50 grooves. Prothoracic coxa and trochanter orange-yellow; prothoracic femur dark brown on inner(medial) surface, pale yellow on front (anterior) surface and orange-yellow on outer (lateral) surface; tibia orange-yellow, with dark brown distal band, dark brown longitudinal line on inner surface and incomplete dark brown band at middle; proximal tarsal segment orange-yellow with dark brown distal band, segments 2–4 orange-yellow, segment 5 dark brown with orange-yellow posterior fringe; outer surface of segments 2–4 entirely dark brown in few specimens (not type). Mesothoracic coxa, trochanter and femur orange-yellow except for dark brown patch at distal end of femur; tibia with pair of terminal spurs, orange-yellow with dark brown band at middle and at each end of segment; tarsus as prothoracic

tarsus. Coloration of metathoracic leg as mesothoracic leg; two pairs of tibial spurs present. Forewing venation as in Text-fig. 17. Upper surface of forewing orange-yellow; small white patch of apically bifurcate, white scales at base of wing; medial marking brown and weakly iridescent brownish grey at distal end of cell and proximally at anal margin of wing (this marking highly variable; weakly marked, as in type, enclosing large orange-yellow patch at anal margin; or strongly marked with small orange-yellow enclosure). Hindwing venation as in Text-fig. 18. Upper surface of hindwing yellowish white or pale yellow, most intensely coloured at anal margin; with terminal band of brownish grey (except 1 ♂ from Bolivia); or in some specimens (not type) whole of hindwing brownish grey except for narrow anal band and apical area; patch of lanceolate, androconial scales present in cell, surrounded by unscaled zone. Under surface of both wings as for upper surface but colours less intense. Under surface of forewing with large area of androconial scales (similar in shape to androconial scales on hindwing) extending from just posterior to cell to anal margin (the area of overlap between fore- and hindwings). Abdomen orange-yellow, with brown dorsally on segments 1–5 (darkest posteriorly) in some specimens (probably not type, judging from remains of first segment).

♀ (two examples). As ♂, except that forewing medial marking encloses small brownish yellow patch at anal margin and that hindwing is greyish brown except for orange-yellow anal band and apical area.

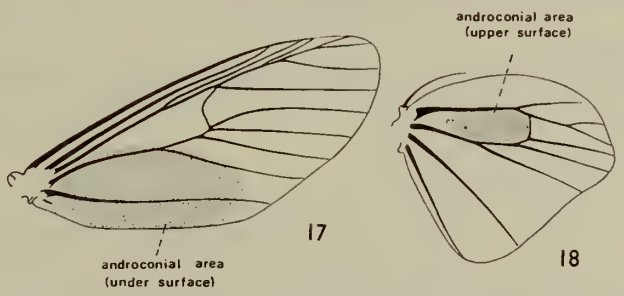
Forewing length: lectotype ♂ 14·0 mm; ♂ 14·0–15·0 mm; ♀ 14·0 mm.

♂ genitalia. Valve with small, dorsomedially-directed process near apex; juxta scobinate, globose anteriorly; uncus bifid, apex of each arm acuminate and hood-like; vesica with single, multispinose cornutus near apex of aedeagus, 3 or 4 robust, thorn-like cornuti and two scobinate zones.

♀ genitalia. Corpus bursae divided into anterior lobe bearing two invaginate, scobinate signa and minutely spinose posterior lobe; ostium protected ventrally by 7th abdominal sternite; scent-tubules simple and short.

This species differs from its apparently close ally, *pseudoflavescens*, by the shape of the dark, medial marking on the forewing (this encloses a yellow marking at the anal margin of the wing and has its proximal margin at 45 degrees to the longitudinal axis of the moth), and in the male genitalia by the longer valves, shorter valve processes and the differently ornamented vesica.

There is extensive individual variation in the coloration of both fore- and hindwings in *flavescens*. The dark medial marking on the forewing may be either unicolorous or much more intensely coloured at anal margin, while the size of the enclosed yellow area and the degree to which the medial marking extends from the tornus along the outer margin both vary considerably. The upper surface



FIGS 17, 18. *Regobarrosia flavescens*, ♂, venation. 17, forewing; 18, hindwing. Scales from the androconial patch on the hindwing are illustrated on Pl. 30, fig. 187.

of the hindwing may be either entirely yellow (a ♂ from Bolivia), yellow with dark distal band, or almost entirely brownish grey (see description) (5 ♂ from Peru).

The type of *asara* is almost identical with that of *flavescens* and its genitalia are nearly identical to those of a male from Pará. (The abdomen of the type of *flavescens* is lost.)

Known from Colombia, Guyana, French Guiana, Brazil, Ecuador, Peru and Bolivia.

MATERIAL EXAMINED.

Halisidota flavescens Walker, lectotype ♂, BRAZIL: Pará (UM). *Automolis asara* Druce, lectotype ♂, ECUADOR: Sarayucu (*Buckley*) (BMNH).

COLOMBIA: 1 ♂, Muzo, 400–800 m (*Fassl*); 1 ♂, Cundinamarca, Cananche, 1900 (*de Mathan*). GUYANA: 1 ♂, Rio Potaro, Tumatumari, ii.1912 (USNM). FRENCH GUIANA: 1 ♀, St. Laurent de Maroni, vi.1915. BRAZIL: 1 ♀, Pará (*Moss*). PERU: 1 ♂, Huambo, 1889 (*de Mathan*); 5 ♂, Junin, Palcazu, 235 m (*Sedlmayr*; *Hoffman*); 1 ♂, Lower Ucayali, Rio Pacaya, viii–ix.1912. BOLIVIA: 2 ♂, Rio Songo, 750 m (*Fassl*); 1 ♂, San Ernesto, 68° W., 15° S., 1000 m, viii–ix.1900 (*Simons*).

Regobarrosia pseudoflavescens (Rothschild) **comb. n.**

(Pl. 31, figs 188, 190, 192)

Automolis pseudoflavescens Rothschild, 1910*c* : 20. [Coloured fig.] Holotype ♂, BRAZIL (BMNH) [examined].
Automolis pseudoflavescens Rothschild; Strand, 1919 : 22.
Automolis pseudoflavescens Rothschild; Hampson, 1920 : 140.

Similar to *flavescens* in many features but distinguished by the following characters. Dark marking on forewing unicolorous (not enclosing yellow area at anal margin of wing), its proximal margin nearly parallel to longitudinal axis of moth. Tarsal segments 2–5 of each leg orange-yellow; segment 1 orange-yellow with distal band of greyish brown. Hindwing yellowish white; more yellowish at apex and anal area, and with pale yellowish brown suffusion in posterior half of wing. (The dorsal surface of abdominal segments 1–5 in both examined specimens is greyish brown.) In the male genitalia the valve is shorter, bears a longer medially directed process, and the vesica is distinctively ornamented.

The female is unknown.

Forewing length: holotype: ♂ 15·0 mm; ♂ 15·5 mm.

MATERIAL EXAMINED.

Automolis pseudoflavescens Rothschild, lectotype ♂, BRAZIL: Minas Gerais, Preto (BMNH).

BRAZIL: 1 ♂, Minas Gerais, Ouro Preto.

Regobarrosia aureogrisea (Rothschild) **comb. n.**

(Pl. 31, figs 189, 191, 193)

Automolis aureogrisea Rothschild, 1910*a* : 38, pl. 5, fig. 36. LECTOTYPE ♂, PERU (BMNH), here designated [examined].

Automolis aureogrisea Rothschild; Strand, 1919 : 15.
Automolis aureogrisea Hampson, 1920 : 144.

♂. Basal segment of palp orange with some dark brownish grey dorsally; segment 2 dark brownish grey with some orange at base and greyish white on front surface (except near apex); apical segment greyish white. Head orange with white patch on each side posterolaterally. Scape of antenna orange posteriorly, white anteriorly; segments 1–9 of flagellum orange, apical 10 or 12 segments white, remainder dark greyish brown. Ground-colour of thorax orange; otherwise as *flavescens*. Tymbal organ with up to 50 grooves. Prothoracic coxa and trochanter orange; front surface of femur dark greyish brown, otherwise orange; tibia dark greyish brown, except for greyish white patch towards apex on front surface and orange area at base of front surface continuous with orange band extending from base to two-thirds of outer surface; tarsus dark greyish brown except for some greyish white scales on rear surface of first segment. Mesothoracic coxa, trochanter and femur orange, the latter with dark greyish brown zone distally; tibia and tarsus as prothoracic leg. Metathoracic coxa, trochanter and femur orange; tibia orange-yellow, with dark greyish brown distal band and spot (latter opposite proximal pair of spurs); first tarsal segment orange proximally, dark greyish brown distally; remaining tarsal segments dark greyish brown. Upper surface of forewing orange, with small, white spot at base of wing and large, elongate, weakly iridescent, olive (3D2) and brownish grey (7D2) medial marking. Upper surface of hindwing orange-yellow at apex and in anal area, otherwise weakly iridescent light brown and reddish grey, becoming sparsely scaled around androconial patch in cell (cf. *flavescens*). Under surface of forewing as upper surface, but without white basal spot and with proximal half of medial marking light grey. (This grey area of scales and those of rest of overlap zone between fore- and hindwings apparently androconial, being similar in scale-shape to androconial zone on upper surface of hindwing.) Under surface of hindwing orange, with weak iridescence of reddish grey in middle part of wing. Abdomen orange.

Forewing length: lectotype ♂ 17·0 mm; ♂ 16·0–18·0 mm.

♂ genitalia. As *flavescens* but valves shorter, pre-apical process longer, and vesica differently shaped and ornamented.

♀ not known.

Readily separable from both *flavescens* and *pseudoflavescens* by the larger size, the shape of the dark, medial marking on the forewing and by the coloration of the tarsi. The male genitalia are also diagnostic.

There is little individual variation discernible in the available material all of which is from Peru.

MATERIAL EXAMINED.

Automolis aureogrisea Rothschild, lectotype ♂, PERU: Carabaya Mts, Santo Domingo, 6000 ft, vii.1902 (*Ockenden*) (BMNH).

PERU: 1 ♂, Carabaya Mts, Santo Domingo, 6000 ft, vi.1902 (*Ockenden*); 3 ♂, [Carabaya Mts], Marcapata, '4500 ft' [Marcapata is higher than this according to *The Times Atlas of the World*, 1968].

ASTRALARCTIA gen. n. [Gender: feminine]

Type-species: *Automolis pulverosa* Schaus, 1905 : 215.

♂. Palps extending 1·0–1·5 mm beyond labrum; terminal segment minute. Antenna weakly serrate (*pulverosa*) or bipectinate (*canalis*), with row of long setae along crest of each serration. Tymbal organ well developed. Mesothoracic tibia bearing one pair of spurs;

metathoracic tibia with two pairs of spurs. Retinaculum short; venation as in Text-figs 19 and 20.

♀. As ♂ but antennae hardly serrate; long setae restricted to lateral margin of each segment. Forewing broader than in ♂ and hindwing relatively larger.

♂ genitalia. Juxta with (*canalis*) or without (*pulverosa*) medial globosity; lateral arms free in *pulverosa*, not free in *canalis*. Apex of valve bifurcate or simple. Uncus simple. Aedeagus without processes; vesica partly scobinate. Eighth abdominal tergite with weakly developed apodemes.

♀ genitalia [♀ of *canalis* not known]. See description of *pulverosa*.

The affinities of this genus are doubtful, but it is fairly closely related to *Idalus* and allied genera of Phaegopterini which have reduced hindwings and a clear distinction between costa and sacculus of the valve in the male genitalia.

Two species are known. Nothing is known about their early stages.

Key to Species

1 Antennae weakly serrate; yellowish white spots present along the veins on the upper surface of the wings; hindwing pale yellow . . . . . ***pulverosa*** (p. 64)

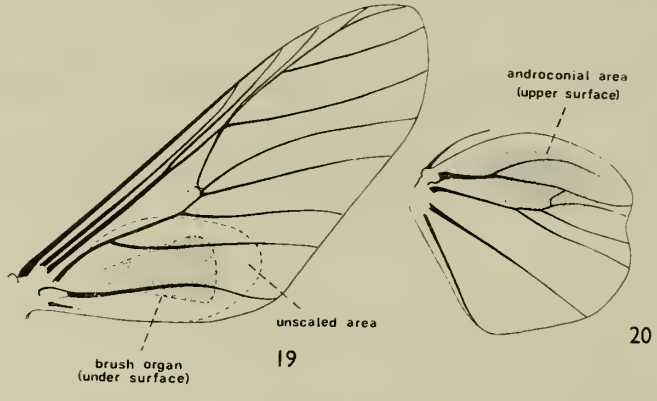
– Antennae bipectinate; veins of upper surface not marked with spots; hindwing greyish brown . . . . . ***canalis*** (p. 65)

Astralarctia pulverosa (Schaus) **comb. n.**

(Text-figs 19, 20; Pl. 32, figs 194–199; Pl. 33, figs 200, 201)

Automolis pulverosa Schaus, 1905 : 215. Holotype ♂, Surinam (USNM) [examined].
Automolis pulverosa Schaus; Hampson, 1920 : 137, fig. 63 (wing venation, scent-organs, head).
Automolis pulverosa Schaus; Seitz, 1921 : 370 (not figured).
Automolis pulverosa amazonica Reich, 1933*b* : 281, figs 3, 4. Syntypes ♂, Brazil (Israel – Reich Collection) [not examined]. **Syn. n.**
Automolis pulverosa Schaus; Watson, 1971 : 77, figs 34c (type), 134a, b (genitalia).

♂. Palps and antennae pale yellowish brown. Antennae weakly serrate. Head pale yellowish brown; darkest in patch between antennae and another posterior to each antenna,



Figs 19, 20. *Astralarctia pulverosa*, ♂, venation. 19, forewing; 20, hindwing. The scent-organs are illustrated on Pl. 32.

and in medial frontal patch. Patagia pale yellowish brown, with yellowish white transverse band in middle and at posterior margin. Rest of thorax yellowish white above, white ventrally. Tegulae pale yellow, with pale yellowish brown anteriorly. Legs pale yellowish brown and white. Upper surface of forewing yellow or greyish brown with yellowish white markings; upper surface of hindwing pale yellow. Under surface of forewing brownish white, darkest apically, with trace of upper surface pattern; under surface of hindwing pale yellow. Under surface of forewing with androconial scale patch in area overlapped by hindwing; this patch covered by hair-pencil. Hindwing has androconial patch in area overlapped by forewing, which probably interacts with forewing hair-pencil. Tymbal organ with 18–20 microtymbals. First abdominal segment yellowish white above; segments 2–6 orange-yellow; 7–8 yellowish brown. Ventral surface of abdomen white.

♀. As ♂ except for character mentioned under genus, and on under surface with dark patch before apex of forewing.

Forewing length: holotype ♂ 13·5 mm; ♂ 15·5–18·0 mm; ♀ 17·5–19·0 mm.

♂ genitalia. Juxta with small, posteriorly directed, digitate process medially, and scobinate, lateral extensions. Costal arm of valve simple. Uncus carinate dorsally, hook-like and curved ventrally at apex. Aedeagus without processes; vesica mostly scobinate.

♀ genitalia. Corpus bursae with pair of small, scobinate signa. Ductus bursae short; sclerotized at ostium and in area on right-hand side of ventral surface of ductus. Lamella postvaginalis deeply emarginate medially. Posterior apophyses nearly twice as long as anterior apophyses. Scent tubules simple, extending to just anterior to ostium.

This species is readily distinguished from *canalis* by the yellow hindwings, and on the forewing by the presence of yellowish white spots along the veins. The male genitalia are equally distinctive, as is the much smaller number of microtymbals. Known to occur in Guyana, French Guiana, Surinam, Venezuela, Bolivia, Peru and Brazil.

MATERIAL EXAMINED.

Automolis pulverosa Schaus, holotype ♂, SURINAM: Surinam River, 'Geldersland' (USNM).

VENEZUELA: 1 ♂, Aragua, Rancho Grande, 10–21.xi.1969 (*Duckworth & Dietz*) (USNM). GUYANA: 1 ♂, 1 ♀, Bartica District, Kartabo, 21.v.1922, 1924; 1 ♀, Bartica. FRENCH GUIANA: 2 ♂, 1 ♀, Maroni River, St Jean (*Le Moult*); 1 ♂, 'Godebert-Maroni' (*Le Moult*); 1 ♂, 1 ♀ (*Bar*). BOLIVIA: 1 ♂, Buenavista, 750 m, viii.1906–iv.1907 (*Steinbach*). BRAZIL: 3 ♂, 1 ♀, Amazonas, Fonte Boa, v.1906, vi.–vii.1907 (*Klages*). PERU: 2 ♂, Rio Huacamayo, Carabaya, La Union, 2000 ft, xi.1904 (*Ockenden*).

Astralarctia canalis (Schaus) comb. n.

Araeomolis canalis Schaus, 1921 : 166. Holotype ♂, PANAMA (USNM) [examined].
Araeomolis canalis Schaus; Watson, 1971 : 19, pls 34d (type), 134c, d (genitalia).

♂. Palp and antennae pale yellowish brown. Front of head yellowish brown, palest ventrolaterally; vertex yellowish brown medially, yellowish white posterolaterally. Patagia yellowish white; each with pale centred, yellowish brown patch in middle. Tegulae yellowish brown, with pale yellow transverse band anteriad and yellowish white posterior and lateral fringe. Rest of thorax probably brown dorsally (damaged in only known specimen), pale yellowish brown ventrally. Legs chiefly pale yellowish brown. Tymbal organ with about 70 microtymbals. Forewing yellowish brown above, with yellowish white markings, most noticeable of which are the postmedial, interneural dots; under surface as for upper surface but pale markings at base of wing absent. Both surfaces of hindwing greyish brown. First segment

of abdomen greyish brown dorsally, 2–4 orange-yellow, 5–8 greyish brown. (Abdomen damaged ventrally.) Forewing length: 17·0 mm.

♂ genitalia. Juxta with small, posteriorly directed, digitate process medially, and scobinate, lateral extensions. Costal arm of valve simple. Uncus carinate dorsally, hook-like and curved ventrally at apex. Aedeagus without processes; vesica mostly scobinate.

♀. Not known.

This species is placed tentatively in *Astralarctia*. The evidence from only two specimens of *canalis* is not conclusive, but as the forewing shape and coloration characters show some concordance between *canalis* and *pulverosa*, it seems reasonable to place the former here at present and to remove it from the distantly related genus *Araeomolis*.

Material examined.

Araeomolis canalis Schaus, holotype ♂, Panama: [Panama City] (*Schaus*) (USNM).

Colombia: 1 ♂, Alto Rio Opon, Santander del Sur, 900–1050 m, 14–26.viii.1948 (*Richter*) (ZSBS).

NYEARCTIA gen. n. [Gender: feminine]

Type-species: *Automolis leucoptera* Hampson, 1920 : 144.

♂. Palp short, extending to just above labrum; terminal segment minute. Proximal half of antennae strongly bipectinate and densely setose; longest pectination 1 mm. Distal half of antennae weakly bipectinate and setose. Thorax robust. Tymbal organ well developed. Meso- and metathoracic tibia each with one pair of short terminal spurs. Venation of wings as in Text-figs 24 and 25. Retinaculum bar-shaped. Wings without recognizable androconial zones.

♀. As ♂, but antenna weakly bipectinate, and outer margin of hindwing weakly convex.

♂ and ♀ genitalia. See descriptions of type-species.

The affinities of this genus are uncertain; the result of the complete lack of wing-markings. The shape of the wings and the general structure of the male genitalia suggest that it is probably fairly closely allied to genera such as *Idalus* and *Selenarctia*. Only one species is known.

Nothing is known about the early stages.

Nyearctia leucoptera (Hampson) comb. n.

(Text-figs 21–25; Pl. 33, figs 202–204; Pl. 34, figs 205–207)

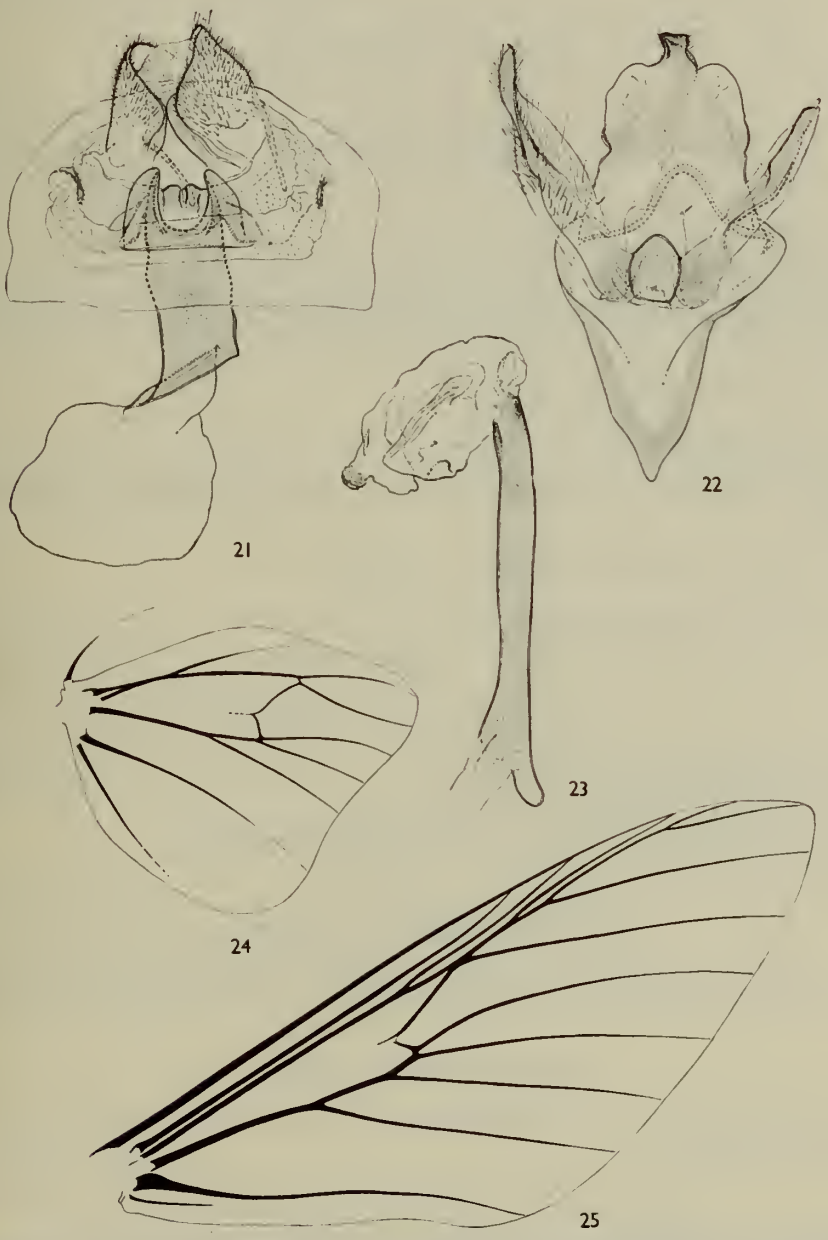
Automolis albescens Rothschild, 1910*a* : 36, pl. 5, fig. 26. Holotype ♀, Guyana (BMNH) [examined].

Automolis leucoptera Hampson, 1920 : 144. A replacement name for *albescens* Rothschild, 1910*a* : 36, preoccupied by *albescens* Rothschild, 1910*a* : 26.

Automolis leucoptera Hampson; Seitz, 1921 : 368, pl. 51c.

♂. Palp yellowish white ventrally, red dorsally. Head yellowish white, with reddish brown transverse band between antennae. Scape of antenna red laterally, reddish brown medially; flagellum dark brown, with some white scales dorsally at distal margin and along medial pectination of each segment. Thorax yellowish white except for red area immediately posterior to eyes. Tymbal organ with about 50 microtymbals. Prothoracic coxa red, with

few white scales proximally; trochanter yellowish white and red; femur yellowish white on surface adjacent to tibia, otherwise red; front surface of tibia speckled dark brown and yellowish white, otherwise red; tarsus speckled dark brown and yellowish white. Mesothoracic coxa yellowish white; trochanter yellowish white and red; femur yellowish white, with red front



FIGS 21–25. *Nyearctia leucoptera*. 21, ♀ genitalia; 22, ♂ genitalia; 23, aedeagus; 24, ♂, hindwing venation; 25, ♂, forewing venation.

surface; tibia yellowish white, with greyish brown, longitudinal line on outer surface and red area distally on front surface; tarsus speckled, dark brown and yellowish white, mostly the latter inner surface; metathoracic leg as mesothoracic leg. Upper surface of forewing yellowish white, translucent; sparsely scaled except in costal area, at base of wing and between vein *1A* and inner margin. Upper surface of hindwing yellowish white, sparsely scaled in middle. Under surface of wings as upper surface. Wings without readily identifiable scent-organs. Abdomen yellowish white.

♀. As ♂ except for sexual differences mentioned under genus, and wings more densely scaled.

Forewing length: holotype ♀ 47·0 mm; ♂ 31·5–33·0 mm; ♀ 43·0–44·0 mm.

♂ genitalia. Saccus elongate. Juxta globose, continuous with base of valves. Sacculus of valve well sclerotized, costal region membranous. Tegumen broad posteriorly. Uncus broad at base; posterior, medial process truncate, strongly carinate dorsally. Aedeagus elongate, with patch of cornutal spines.

♀ genitalia. Corpus bursae with pair of minutely scobinate signa; ductus bursae long, sigmoid, sclerotized. Lamella antevaginalis emarginate medially. Lamella postvaginalis conical; membranous medially. Anterior apophyses very short; posterior apophyses better developed. Scent tubules simple, extending to just beyond ostium.

Known only from Guyana and Brazil.

MATERIAL EXAMINED.

Automolis leucoptera Hampson, holotype ♂, GUYANA: 'bought at Georgetown' (BMNH).

BRAZIL: 5 ♂, 4 ♀, Pará (*Moss*) (BMNH).

Previously described genera

AGARAEA Herrich-Schäffer

Agaraea Herrich-Schäffer, [1855]: pl. 76 (wrapper). Type-species: *Agaraea longicornis* Herrich-Schäffer, [1855]: ibidem, by monotypy.
Agoraea; Herrich-Schäffer, [1856] : 20. Incorrect subsequent spelling.
Agaraea Herrich-Schäffer; Watson, 1971 : 2. [Types of six species illustrated.]

Agaraea strigata (Reich) **comb. n.**

Automolis strigata Reich, 1936 : 422. Type(s) ♂ [no locality given] (Reich Collection, Israel) [not examined]. [Compared by its author with *internervosa* Dognin (see Watson, 1971).]

ARAEOMOLIS Hampson

Araeomolis Hampson, 1901 : 38. Type-species: *Araeomolis rhodographa* Hampson, 1901 : 38, by original designation.

Araeomolis irregularis (Rothschild) **comb. n.**

Idalus irregularis Rothschild, 1910*a* : 23, pl. 4, fig. 9. LECTOTYPE ♂, BRAZIL: Amazonas, Fonte Boa, x.1906 (*Klages*) (BMNH), here designated [examined].

F*

Idalus irregularis Rothschild; Strand, 1919 : 5.
Automolis irregularis (Rothschild) Hampson, 1920 : 134.
Automolis irregularis (Rothschild); Seitz, 1921 : 376, pl. 52h [unrecognizable as this species].

Placed provisionally in *Araeomolis*; there are two known specimens of this species, both males (BMNH).

CRATOPLASTIS Felder

Cratoplastis Felder, 1874 : 3 (explanation to pl. 102). Type-species: *Cratoplastis diluta* Felder, 1874, ibidem, by monotypy.
[*Rhipha* Walker sensu Travassos, 1943 : 456. Partim.]
[*Rhipha* Walker sensu Rego-Barros, 1968 : 1. Partim.]
Cratoplastis Felder; Watson, 1971 : 5.

The type-species of this genus was found by Blest (1964) to produce sound when handled vigorously and to respond with 'reflex immobilization' (Blest, 1957). Specimens were rejected by *Cebus* monkeys. He also pointed out the resemblance between *diluta* and Lampyrid beetles in colour-pattern.

Cratoplastis duplicata (Gaede) comb. n.

Automolis duplicata Gaede, 1928 : 28. LECTOTYPE ♂, COLOMBIA: W., between Tumaco and Pasto (*Niepelt*) (MNHU), here designated [examined].

CRESERA Schaus

Cresera Schaus, 1894 : 232. Type-species: *Cresera annulata* Schaus, 1894 : 232, by monotypy.
Cresera Schaus; Travassos, 1943 : 457. Partim. [Synonymy of *Gorgonidia* Dyar.]
Cresera Schaus; Travassos, 1944*b* : 445. Partim.
Cresera Schaus; Rego-Barros, 1954 : 1.
Cresera Schaus; Rego-Barros, 1958 : 3.
Cresera Schaus; Watson, 1971 : 5. [Removal from synonymy of *Gorgonidia* Dyar; illustrations of three types.]

Cresera ilioides (Schaus) comb. n.

Automolis ilioides Schaus, 1905 : 219. Holotype ♂, GUYANA: Omai (USNM) [examined].
Automolis ilioides Schaus; Strand, 1919 : 19.
Automolis ilioides Schaus; Hampson, 1920 : 170, pl. 47, fig. 3.
Automolis ilioides Schaus; Seitz, 1921 : 370, pl. 51a. .
Automolis ilioides Schaus; Watson, 1971 : 45, pls 196 (type), 109e, f (genitalia).

DEMOLIS Hampson

Demolis Hampson, 1901 : 31. Type-species: *Demolis albicostata* Hampson, 1901 : 31, by original designation.
Demolis Hampson; Seitz, 1922 : 383.
Demolis Hampson; Travassos, 1957 : 9. [Revision.]

The nominal species *Automolis niveolineata* is here transferred to *Demolis* and simultaneously synonymized.

Demolis albitegula (Rothschild)

Evius albitegula Rothschild, 1935 (August) : 239. LECTOTYPE ♂, BRAZIL: Sta Catarina, Jaragua do Sul, x.1932 (*Hoffmann*) (BMNH), here designated [examined].
Automolis niveolineata Reich, 1935 (September): 277, figs 6, 7. Syntypes ♂ and ♀, BRAZIL: Sta Catarina, Rio Loeiss, 'Neu-Bremen' (Reich Collection, Israel) [1 ♂ syntype examined]. **Syn. n.**
Demolis albitegula (Rothschild); Travassos, 1957 : 13 [figs of moth, venation, legs, antennae and ♂ genitalia].

DISCONEURA Bryk

Disconeura Bryk, 1953 : 208. Type-species: *Disconeura tristriata* Bryk, 1953 : 208, by original designation.

Disconeura dissimilis (Druce) **comb. n.**

Lophocampa dissimilis Druce, 1910 : 169. LECTOTYPE ♂, PERU: Chanchamayo, 1000–1500 m (*Watkins*) (BMNH), here designated [examined].
Halisidota dissimilis (Druce) Strand, 1919 : 74.
Automolis dissimilis (Druce) Hampson, 1920 : 176, pl. 47, fig. 10 [♀; anal margin of forewing should be nearly straight; segments 1–5 of abdomen should be dark brown dorsally, each with pair of orange-yellow spots].
Automolis dissimilis (Druce); Seitz, 1921 : 372, pl. 51g [this seems to be a copy of Hampson's figure, but has added errors].

Disconeura drucei (Rothschild) **comb. n.**

Automolis drucei Rothschild, 1922 : 487. [Comparison with *dissimilis* Druce.] Holotype ♀, PERU: Junin province (BMNH) [examined].

Disconeura inexpectata (Rothschild) **comb. n.**

Halisidota inexpectata Rothschild, 1910*c* : 70. LECTOTYPE ♂, PERU: Carabaya, Tinguri, 3400 ft, viii.1904 (*Ockenden*) (BMNH), here designated [examined].
Halisidota inexpectata Rothschild; Strand, 1919 : 76.
Automolis inexpectata (Rothschild) Hampson, 1920 : 175.
Automolis inexpectata (Rothschild); Seitz, 1921 : 372, pl. 51g [the outer margin of forewing should be more strongly convex, the medial band interrupted posterior to discocellular vein and the ground-colour of both wings dull white].
Automolis inexpectata (Rothschild); Carrasco, 1971 : 140. [Defoliator of *Inga* spp.; irritant hairs.]

Disconeura linaza (Dognin) **comb. n.**

Idalus linaza Dognin, 1898 : 345. Holotype ♀, PARAGUAY (USNM) [examined].
[*Automolis lutosa* (Hübner) sensu Hampson, 1901 : 46. Misidentification, partim.]
Automolis linaza (Dognin); Strand, 1919 : 20.
Automolis lutosa form *linaza* (Dognin); Seitz, 1921 : 372.
Automolis linaza (Dognin); Watson, 1971 : 51, pls 33d (type), 238d (genitalia).

Disconeura lutosa (Hübner) comb. n.

Halisidota lutosa (Hübner) Kirby, 1892 : 210.
Automolis lutosa (Hübner) Hampson, 1901 : 46. Partim. [Synonymy of *linaza* Dognin.]
Automolis lutosa (Hübner); Strand, 1919 : 20.
Automolis lutosa (Hübner); Seitz, 1921 : 372.

Subspecies ***Disconeura lutosa lutosa*** (Hübner)
Empusa lutosa Hübner, [1820*a*], **2**: pl. 182, figs 1–4. Type(s), ♂, ♀ [locality unknown] [not examined].

Subspecies ***Disconeura lutosa frater*** (Rothschild) **comb. n.**
Automolis lutosa frater Rothschild, 1922 : 477. LECTOTYPE ♂, Brazil: Pará (*Moss*) (BMNH), here designated [examined].

The type of *frater* differs little from fig. 4 of *lutosa* in Hübner, [1820*a*], **2**: pl. 182.

Disconeura peculiaris (Rothschild) comb. n.

Automolis peculiaris Rothschild, 1933 : 171, LECTOTYPE ♂, Brazil: Pará (*Moss*) (BMNH), here designated [examined].

Disconeura soror (Rothschild) comb. n.

Automolis soror Rothschild, 1917 : 481. Holotype ♀, Brazil: Pará (*Moss*) (BMNH) [examined].

ECHETA Herrich-Schäffer

Echeta Herrich-Schäffer, [1856] : 16, 17. Type-species: *Creatonotus divisus* Herrich-Schäffer, [1855] : pl. 52, fig. 282 (wrapper), by subsequent designation of Kirby, 1892 : 197.
[*Automolis* Hübner sensu Hampson, 1920 : 155, et auctorum. Partim.]
Echeta Herrich-Schaffer; Travassos, 1943 : 456, 468. [Redescription and reinstatement.]

The following 12 nominal species form a reasonably compact group together with the type-species, but there is possibly some specific synonymy yet to be unravelled. The type-specimens involved are of both sexes and there is a high degree of sexual dimorphism in this genus.

Echeta brunneireta (Dognin) comb. n., stat. rev.

Automolis brunneireta Dognin, 1906 : 182. Lectotype ♂, Peru: Carabaya (USNM), designated by Watson, 1971 : 18 [examined].
Automolis brunneireta Dognin; Strand, 1919 : 15.
Automolis brunneireta Dognin; Hampson, 1920 : 148.
Automolis rubrireta form *brunneireta* Dognin; Seitz, 1921 : 371, pl. 51d [fair guide to pattern but inaccurate in details].
Automolis rubrireta form *brunneireta* Dognin; Watson, 1971 : 18, pls 42c (type), 149a, b (genitalia).

Echeta excavata (Schaus) comb. n.

Automolis excavata Schaus, 1910 : 202. Lectotype ♀, Costa Rica: Tuis (USNM), designated by Watson, 1971 : 32 [examined].

Automolis excavata Schaus; Strand, 1919 : 17.
Automolis excavata Schaus; Hampson, 1920 : 145, pl. 46, fig. 5.
Automolis excavata Schaus; Seitz, 1921 : 376, pl. 52h.
Automolis excavata Schaus; Watson, 1971 : 32, pls 42f (type), 240d (genitalia).

Echeta grandis (Druce) comb. n.

Zatrephes grandis Druce, 1883 : 383, pl. 40, fig. 5. LECTOTYPE ♂, Ecuador: Intaj (*Buckley*) (BMNH), here designated [examined].
Automolis grandis (Druce) Hampson, 1901 : 50.
Automolis grandis (Druce); Strand, 1919 : 19.
Automolis grandis (Druce); Seitz, 1921 : 371, pl. 51c (♂ & ♀).

Echeta juno (Schaus) comb. n.

Scaptius juno Schaus, 1892 : 279. Lectotype ♀, Brazil: Petropolis (USNM), designated by Watson, 1971 : 50 [examined].
Automolis juno (Schaus) Hampson, 1901 : 51.
Automolis juno (Schaus); Strand, 1919 : 19.
Automolis juno (Schaus); Seitz, 1921 : 371.
Automolis juno (Schaus): Watson, 1971 : 50, pls 42b (type), 240b (genitalia).

Echeta milesi (Rothschild) comb. n.

Automolis milesi Rothschild, 1922 : 473. LECTOTYPE ♀, Brazil: Pará (*Moss*), here designated [examined].

Echeta pandiona (Stoll) comb. n.

Phalaena pandiona Stoll, [1782] : 228, 251, pl. 397, fig. I. Holotype ♀, Surinam [not examined].
Automolis pandiona (Stoll) Rothschild, 1910*c* : 22.
Automolis pandiona (Stoll); Strand, 1919 : 22.
Automolis pandiona (Stoll); Seitz, 1921 : 376, pl. 524 [dark areas of forewing should be uniformly yellowish brown; hind wing should be yellowish white, with pink distally and in anal region].

Echeta rhodocyma (Hampson) comb. n., stat. rev.

Automolis rhodocyma Hampson, 1909 : 357. LECTOTYPE ♂, Peru: Rio Huacamayo, 3100 ft, vi.1904 (*Ockenden*) (BMNH), here designated [examined].
Automolis rhodocyma Hampson; Strand, 1919 : 23.
Automolis rhodocyma Hampson; Hampson, 1920 : 148, pl. 46, fig. 9.
Automolis rubrireta form *rhodocyma* Hampson; Seitz, 1921 : 371 [attributed to Dognin, in error], pl. 51c [inaccurate and misleading].

Echeta rhodographa (Dognin) comb. n., stat. rev.

Automolis rhodographa Dognin, 1914 : 17. Holotype ♀, Peru: Yuhuarmayo, 1200 ft, iv.1912 (USNM) [examined].
Automolis rhodographa Dognin; Hampson, 1920 : 147, pl. 46, fig. 6.
Automolis rubrireta form *rhodographa* Dognin; Seitz, 1921 : 371, pl. 51d.
Automolis rubrireta form *rhodographa* Dognin; Watson, 1971 : 80, pls 42e (type), 240c (genitalia).

Strand (1919 : 23), presumably inadvertently, listed *lobifer* Herrich-Schäffer and '*incerta* Druce' as junior synonyms of *rhodographa* Dognin, not of *reducta* Walker [*Sutonocrea*]. Travassos (1944*a* : 302) re-established *lobifer* and *incerta* Walker as the valid names of two distinct species of the genus *Sutonocrea* Butler.

Echeta rubrireta (Dognin) **comb. n.**

Automolis rubrireta Dognin, 1906 : 182. Holotype ♂, PERU: Carabaya, 14.iii.1906 (USNM) [examined].
Automolis rubrireta Dognin; Strand, 1919 : 23.
Automolis rubrireta Dognin; Hampson, 1920 : 147, pl. 46, fig. 7 (♂) and 8 (♀: probably *brunneireta* Dognin).
Automolis rubrireta Dognin; Seitz, 1921 : 371, pl. 51b (♂; grossly inaccurate) and 51c (♀; probably *brunneireta* Dognin).
Automolis rubrireta Dognin; Watson, 1971 : 82, pls 42d (type), 149c, d (genitalia).

Echeta semirosea (Walker) **comb. n.**

Automolis semirosea Walker, [1865] : 103. Holotype ♂, BRAZIL: Amazonas, Ega [Tefé] (Bates) (BMNH) [examined].
Apiconema semirosea (Walker) Kirby, 1892 : 170.
Automolis semirosea Walker; Hampson, 1901 : 54, pl. 36, fig. 3 [the pale area on the hind wing represents a worn area on the left-hand wing of the holotype].
Automolis semirosea Walker; Strand, 1919 : 24.
Automolis semirosea Walker; Seitz, 1921 : 370, pl. 51b [grossly inaccurate].

Echeta subtruncata (Rothschild) **comb. n.**

Automolis subtruncata Rothschild, 1910*a* : 41, pl. 6, fig. 12. Holotype ♀, BRAZIL: Sta Catarina (BMNH) [examined].
Automolis subtruncata Rothschild; Strand, 1919 : 24.
Automolis subtruncata Rothschild; Hampson, 1920 : 146.
Automolis subtruncata Rothschild; Seitz, 1921 : 376, pl. 52h [probably not this species].

Echeta trinotata (Reich) **comb. n.**

Automolis trinotata Reich, 1933*a* : 259. Holotype ♂, BRAZIL: Amazonas, 'Uypiranga-Manaos', 30 m, xii-ii (Reich Collection, Israel) [not examined].
Automolis trinotata Reich; Reich, 1933*b* : fig. 6.

EUPSEUDOSOMA Grote

Eupseudosoma Grote, 1865 : 240. Type-species: *Charidea nivea* Herrich-Schäffer, [1855].
Eupseudosoma Grote; Travassos, 1945 : 513. [Partial revision.]

Eupseudosoma aberrans Schaus (see Watson, 1971) was found by Blest (1964) to have a low threshold for sound production in response to tactile stimuli and to produce either the type of display in which the wings are alternately depressed

and elevated and the abdomen raised, or to respond with reflex immobilization (Blest, 1957). Specimens were reported by Blest to have been rejected by *Cebus* monkeys.

Eupseudosoma larissa (Druce) **comb. n.**

Idalus larissa Druce, 1890 : 496, pl. 42, fig. 5. LECTOTYPE ♂, Brazil: Pará, R. Amazon, Santarem, x.1884 (*Leech*) (BMNH), here designated [examined].
Automolis larissa (Druce) Hampson, 1901 : 40, fig. 33 (venation, pattern, head).
Automolis larissa (Druce); Strand, 1919 : 20.
Automolis larissa (Druce); Seitz, 1921 : 374, pl. 52e.

GLAUCOSTOLA Hampson

Glaucostola Hampson, 1901 : 87. Type-species: *Leucopsumis guttipalpis* Walker, 1856 : 1649, by original designation.
Glaucostola Hampson; Strand, 1919 : 37.
Glaucostola Hampson; Seitz, 1920 : 329.

The nominal species *subtussignata* is simultaneously here transferred from *Automolis* and synonymized with *Glaucostola flavida*. There is a little doubt, however, that *flavida* is not congeneric with the type-species of *Glaucostola* and that its taxonomic placement needs to be investigated.

Four species of this genus were studied by Blest (1964). All reacted to tactile stimuli with 'reflex immobilization' (Blest, 1957). Three of these species had a medium threshold of sound production. *Glaucostola flavida* was rejected by *Cebus* monkeys.

Glaucostola flavida Schaus

Glaucostola flavida Schaus, 1905 : 221, pls 47 (type), 156e–g (genitalia). Holotype ♂, French Guiana: St Laurent, Maroni River (USNM) [examined].
Glaucostola flavida Schaus; Seitz, 1920 : 330 [no figure].
Automolis subtussignata Bryk, 1953 : 215. Holotype ♀, Brazil: Amazonas, Rio Purus (NR) [examined]. **Syn. n.**

The unusual many-grooved tymbal organ of this species is shown on Pl. 34.

GORGONIDIA Dyar

Gorgonidia Dyar, 1898*a* : 36. Type-species: *Zatrephes garleppi* Druce, 1898*a* : 148, by subsequent designation of Hampson, 1901 : 39.
[*Automolis* Hübner sensu Hampson, 1901 : 39 et auctorum. Partim.]
[*Cresera* Schaus sensu Travassos, 1943 : 457. Synonymy of *Gorgonidia*. Partim.]
[*Cresera* Schaus sensu Travassos, 1944*b* : 445. Partim.]
Gorgonidia Dyar; Watson, 1971 : 5. [Re-establishment of genus.]

Gorgonidia garleppi, one of the two species dealt with here, was transferred to *Automolis* by Watson (1971 : 5, 60) but is included here so that the associated subspecies names can be dealt with.

Gorgonidia buckleyi (Duce) **comb. n.**

Automolis buckleyi (Druce); Strand, 1919 : 15.
Automolis buckleyi (Druce); Seitz, 1921 : 371.

Subspecies ***Gorgonidia buckleyi buckleyi*** (Druce)

Zatrephes buckleyi Druce, 1883 : 383, pl. 40, fig. 9. LECTOTYPE ♂, Ecuador: Sarayacu (*Buckley*) (BMNH), here designated [examined].

Subspecies ***Gorgonidia buckleyi harterti*** (Rothschild) **comb. n.**

Automolis buckleyi harterti Rothschild, 1910*a* : 44, pl. 6, fig. 15. LECTOTYPE ♂, Brazil: Amazonas, Fonte Boa, vii.1907 (*Klages*), here designated [examined].
Automolus buckleyi var. *harterti* Rothschild; Strand, 1919 : 15.
Automolis buckleyi harterti Rothschild; Hampson, 1920 : 168.
Automolis buckleyi harterti Rothschild; Seitz, 1921 : 371, pl. 51e.

Subspecies ***Gorgonidia buckleyi whitfordi*** (Rothschild) **comb. n.**

Automolis buckleyi whitfordi Rothschild, 1910*a* : 44. [No fig.] Lectotype ♂, Guyana: 'bought at Georgetown' (BMNH), designated by Hampson, 1920 : 164 [examined].
Automolis buckleyi var. *whitfordi* Rothschild; Strand, 1919 : 15.
Automolis buckleyi whitfordi Rothschild; Hampson, 1920 : 169.
Automolis buckleyi whitfordi Rothschild; Seitz, 1921 : 371 [no fig.].

Gorgonidia garleppi (Druce)

Subspecies ***Gorgonidia garleppi garleppi*** (Druce)

Zatrephes garleppi Druce, 1898 (February) : 148. LECTOTYPE ♀, Bolivia (*Garlepp*) (BMNH), here designated [examined].
Gorgonidia mirabilior Dyar, 1898 (March): 37. Holotype ♂, Peru: Piches & Perene Volcanoes, 2000–3000 ft (USNM) [examined]. [Synonymized by Hampson, 1901 : 63.]
Automolis garleppi (Druce) Hampson, 1901 : 63, fig. 12.
Automolis garlelpi garleppi (Druce); Seitz, 1921 : 371, pl. 51e.
Cresera garleppi (Druce) Travassos, 1943 : 457.
Gorgonidia garleppi (Druce) Watson, 1971 : 60, pls 62 (type of *mirabilior*), 192c, d (genitalia).

Subspecies ***Gorgonidia garleppi inversa*** (Rothschild) **comb. n.**

Automolis garleppi inversa Rothschild, 1910*a* : 44, pl. 6, fig. 17. LECTOTYPE ♂, Peru: Carabaya, Santo Domingo, 6500 ft, x (*Ockenden*) (BMNH), here designated [examined].
Automolis garleppi var. *inversa* Rothschild; Strand, 1919 :18.
Automolis garleppi inversa Rothschild; Hampson, 1920 : 169.
Automolis garleppi inversa Rothschild; Seitz, 1921 : 371, pl. 51e.

Subspecies ***Gorgonidia garleppi maronensis*** (Rothschild) **comb. n.**

Automolis garleppi maronensis Rothschild, 1917 : 481. LECTOTYPE ♂, French Guiana: St Jean de Maroni (*Le Moult*) (BMNH), here designated [examined].
Automolis garleppi maronensis Rothschild; Hampson, 1920 : 169.
Automolis garleppi maronensis Rothschild; Seitz, 1921 : 371 [no fig.].

Subspecies ***Gorgonidia garleppi pallidipennis*** (Rothschild) **comb. n.**

Automolis garleppi pallidipennis Rothschild, 1910*c* : 25. LECTOTYPE ♂, Brazil: Amazonas, Fonte Boa, v.1906 (*Klages*) (BMNH), here designated [examined].
Automolis garleppi var. *pallidipennis* Rothschild; Strand, 1919 : 18.
Automolis garleppi pallidipennis Rothschild; Hampson, 1920 : 169.
Automolis garleppi pallidipennis Rothschild; Seitz, 1921 : 371 [no fig.].

Subspecies ***Gorgonidia garleppi cubotaensis*** (Reich) **comb. n.**

Automolis garleppi cubotaensis Reich, 1938 : 195, fig. 4. Syntypes 5 ♂, Brazil: Serra do Cubatao (between Santos and São Paulo), viii. (*Reich*) (Reich Collection, Israel) [1 ♂ examined, labelled 'Paratype'].

HALISIDOTA Hübner

Halisidota Hübner [1819*b*] : 170. Type-species: *Phalaena tessellaris* J. E. Smith, 1797 : 149, pl. 75, by subsequent designation of Kirby, 1892 : 209.
Halisidota Hübner; Travassos, 1946 : 319. [Bibliography. Redescription.]
Halisidota Hübner; Watson, 1971 : 5. [Illustrations of 96 type-specimens.]

Halisidota baritioides (Rothschild) comb. rev.

Halisidota baritioides Rothschild, 1909 : 221. Holotype ♂, Brazil: Amazonas, Fonte Boa, ix.1906 (*Klages*) (BMNH). [Examined.]
Halisidota baritioides Rothschild; Rothschild, 1910*c* : pl. 12, fig. 11.
Halisidota baritioides Rothschild; Strand, 1919 : 70.
Automolis baritioides (Rothschild); Hampson, 1920 : 150.
Automolis baritioides (Rothschild); Seitz, 1921 : 370, pl. 51b [grossly inaccurate].

IDALUS Walker

Empusa Hübner [1819*b*] : 170. Type-species: *Phalaena admirabilis* Cramer [1777] : 11, 147, pl. 103, fig. 9, by subsequent designation of Hampson, 1901 : 14. A junior homonym of *Empusa* Illiger, 1798 (Orthoptera); replaced by *Idalus* Walker, 1855.
Idalus Walker, 1855 : 645. Type-species: *Phalaena admirabilis* Cramer [1777] : 11, 147, pl. 103, fig. 9, by monotypy of *Empusa* Hübner.
[*Lampruna* Schaus, 1894 : 231. Type-species: *Lampruna rosea* Schaus, 1894 : 231, by monotypy. Listed here following its placement in synonymy by Hampson, 1901 : 14. Its type-species is obviously not congeneric with that of *Idalus*.]
Idalus Walker; Seitz, 1921 : 347.
Idalus Walker; Travassos, 1950 : 217, figs. [Five species reviewed.]
Idalus Walker; Watson, 1971 : 2, 6. [Types of 26 species illustrated.]

Several species currently placed in *Idalus* should be transferred to other genera. However, those listed by Travassos and Watson (see above), together with the following 24 species (and three subspecies), form a particularly homogeneous unit congeneric with *admirabilis*, the type-species of *Idalus*.

Six nominal species of this genus (including *aletis* Schaus, a junior synonym of *Idalus aleteria* (Schaus), *lineosa*, *vitrea* and *critheis*, then in *Automolis*) were studied by Blest (1964). They responded to handling with reflex immobilization (Blest, 1957), or the type of display in which the wings are alternately raised and depressed and the abdomen raised. They had various thresholds for sound production. Five species were rejected by *Cebus* monkeys as a source of food.

Idalus albescens (Rothschild) comb. n.

Eupseudosoma albescens Rothschild, 1910*a* : 26, pl. 4, fig. 25. LECTOTYPE ♀, Surinam: Maroewym Valley, Aroewarwa Creek, iv.1905 (*Klages*) (BMNH), here designated [examined].

Eupseudosoma albescens Rothschild; Strand, 1919 : 9.
Automolis albescens (Rothschild) Hampson, 1920 : 137, fig. 64 [head, venation, pattern].
Automolis albescens (Rothschild); Seitz, 1921 : 368, pl. 50h [coloration should be white, except for yellow band on head].

Idalus crinis Druce **comb. rev.**

Idalus crinis Druce, 1884 : 89, pl. 9, fig. 18. Holotype ♀, Mexico: Presidio (*Forrer*) (BMNH) [examined].
Automolis crinis (Druce) Hampson, 1901 : 42, fig. 36 [head, venation, pattern].
Automolis crinis (Druce); Strand, 1919 : 16.
Automolis crinis (Druce); Seitz, 1921 : 369, pl. 52a.

Idalus critheis Druce **comb. rev.**

Idalus critheis Druce, 1884 : 89, pl. 9, fig. 19. Type(s) Panama: Volcan de Chiriqui ('Ribbe, mus Staudinger') [not examined].
Automolis critheis (Druce) Hampson, 1901 : 40.
Automolis critheis (Druce); Strand, 1919 : 16.
Automolis critheis (Druce); Seitz, 1921 : 369, pl. 50k.

Idalus decisa (Rothschild) **comb. n.**

Automolis decisa Rothschild, 1917 : 480. Holotype ♀, French Guiana: St Jean de Maroni (*Le Moult*) (BMNH) [examined].
Automolis decisa Rothschild; Hampson, 1920 : 141, pl. 45, fig. 19.
Automolis decisa Rothschild; Seitz, 1921 : 369, pl. 50k [inaccurate: forewing should be white distal to medial fascia and there should be a pair of dark spots on the metascutum].

Idalus delicata Möschler **comb. rev.**

Idalus delicata Möschler, 1886 : 29, fig. 12. LECTOTYPE ♀, Jamaica (MNHU), here designated [examined].
Automolis delicata (Möschler) Hampson, 1901 : 43.
Automolis delicata (Möschler); Strand, 1919 : 16.
Automolis delicata (Möschler); Seitz, 1921 : 369, pl. 50k [extremely inaccurate; reference should be made to Möschler, 1886, fig. 12].

Idalus dilucida (Rothschild) **comb. n.**

Automolis dilucida Rothschild, 1910*c* : 26. Holotype ♂, Peru: Perené R., iii.1900 (*Simons*) (BMNH) [examined].
Automolis dilucida Rothschild; Strand, 1919 : 16.
Automolis dilucida Rothschild; Hampson, 1920 : 152.
Automolis dilucida Rothschild; Seitz, 1921 : 374, pl. 52d [poor fig., but type is worn and the degree of inaccuracy is doubtful].

Idalus dognini (Rothschild) **comb. n.**

Automolis dognini Rothschild, 1910*c* : 19, pl. 13, fig. 10.
Automolis dognini Rothschild; Strand, 1919 : 17.

Automolis dognini Rothschild; Hampson, 1920 : 141.
Automolis dognini Rothschild; Seitz, 1921 : 369, pl. 52a [inaccurate: the dorsal surface of the type head is yellow, the dark medial line is uniform in width and the abdomen lacks dark medial spots].

Idalus dorsalis (Seitz) comb. n., stat. n.

Automolis ochracea form *dorsalis* Seitz, 1921 : 369, pl. 50k. Type(s) COLOMBIA: Villavicencio (*Fassl*) [not traced; there is a ♂ from the type-locality, collected by Fassl, in the BMNH collection].

Idalus erythronota (Herrich-Schäffer) comb. rev.

Phaegoptera erythronota Herrich-Schäffer [1853] : pl. 14, fig. 58 (wrapper). LECTOTYPE ♂, VENEZUELA (MNHU), here designated [examined].
Idalus erythronota (Herrich-Schäffer) Kirby, 1892 : 199.
Automolis erythronotus (Herrich-Schäffer) Hampson, 1901 : 49, fig. 43 [head, venation, pattern].
Automolis erythronota (Herrich-Schäffer); Strand, 1919 : 17.
Automolis erythronotus (Herrich-Schäffer); Seitz, 1921 : 374, pl. 52c.

Idalus felderi (Rothschild) comb. n.

Automolis felderi Rothschild, 1909 : 225. LECTOTYPE ♀, COLOMBIA (BMNH), here designated [examined].
Automolis felderi Rothschild; Rothschild, 1912 : pl. 5, fig. 19.
Automolis felderi Rothschild; Hampson, 1920 : 167.
Automolis felderi Rothschild; Seitz, 1921 : 373, pl. 51g [grossly inaccurate].

Idalus flavicostalis (Rothschild) comb. n.

Automolis flavicostalis Rothschild, 1935 : 241. LECTOTYPE ♂, BRAZIL: Sta Catarina, Jaragua do Sul, ix.1932 (*Hoffman*) (BMNH), here designated [examined].

Idalus idalia (Hampson) comb. n.

Automolis idalia Hampson, 1901 : 48, pl. 36, fig. 17. Holotype ♂, BRAZIL: Rio de Janeiro (BMNH) [examined].
Automolis idalia Hampson; Strand, 1919 : 19.
Automolis idalia Hampson; Seitz, 1921 : 369, pl. 50i [inaccurate in several features, but useful guide].

Idalus intermedia (Rothschild) comb. n.

Automolis intermedia Rothschild, 1910*a* : 48, pl. 6, fig. 37. LECTOTYPE ♂, PERU: Carabaya, R. Huacamayo, La Union, 2000 ft, xi.1904 (*Ockenden*) (BMNH), here designated [examined].
Automolis intermedia Rothschild; Strand, 1919 : 19.
Automolis intermedia Rothschild; Hampson, 1920 : 167.
Automolis intermedia Rothschild; Seitz, 1921 : 376, pl. 52g.

Idalus lineosa Walker comb. rev.

Idalus lineosus Walker, 1869 : 10. LECTOTYPE ♀, [locality unknown] (BMNH), here designated [examined].

Automolis lineosa (Walker) Hampson, 1901 : 60, pl. 36, fig. 4 (♂). [Not a misidentification as stated by Strand, 1919 : 20.]
Automolis lineosa (Walker); Strand, 1919 : 20.
Automolis lineosa (Walker); Hampson, 1920 : 166. Partim. [Incorrect synonymy of *sublineata* Rothschild and *perlineosa* Rothschild.]
Automolis lineosa (Walker); Seitz, 1921 : 374, pl. 52d [inaccurate; possibly represents *sublineata* Rothschild]. Partim. [Incorrect synonymy of *perlineosa* Rothschild.]

Idalus luteorosea (Rothschild) comb. n.

Automolis luteorosea Rothschild, 1910*a* : 40, pl. 5, fig. 40. Holotype ♀, GUYANA: Christianburg, Rio Demerara (BMNH) [examined].
Automolis luteorosea Rothschild; Strand, 1919 : 20.
Automolis luteorosea Rothschild; Hampson, 1920 : 131.
Automolis luteorosea Rothschild; Seitz, 1921 : 369, pl. 52a [forewing should be narrower at base, and greenish yellow markings replaced by orange-yellow].

Idalus metacrinis (Rothschild) comb. n.

Automolis metacrinis Rothschild, 1910*a* : 37, pl. 5, fig. 27. LECTOTYPE ♂, COLOMBIA: Sierra Nevada de Santa Marta, Onaca, 2000 ft (*Engelke*) (BMNH), here designated [examined].
Automolis metacrinis Rothschild; Strand, 1919 : 21.
Automolis metacrinis Rothschild; Hampson, 1920 : 136.
Automolis metacrinis Rothschild; Seitz, 1921 : 369, pl. 52a [inaccurate; basal marking of forewing should reach thorax anteriorly and orange-yellow marking should extend nearly to anal margin].
Automolis metacrinis Rothschild; Gaede, 1923 : 3. [Sexual dimorphism.]

Idalus monostidza (Hampson) comb. n.

Automolis monostidza Hampson, 1916 : 231. Holotype ♀, PERU: Yahuarmayo, 1200 ft, iv.1912 (BMNH) [examined].
Automolis monostidza Hampson; Hampson, 1920 : 143, pl. 46, fig. 2.
Automolis monostidza Hampson; Seitz, 1921 : 369, pl. 52a.

Idalus multicolor (Rothschild) comb. n.

Automolis multicolor Rothschild, 1909 : 224. LECTOTYPE ♂, GUYANA: Potaro, ii.1908 (*Klages*) (BMNH), here designated [examined].
Automolis multicolor Rothschild; Rothschild, 1912 : pl. 6, fig. 18.
Automolis multicolor Rothschild; Strand, 1919 : 21.
Automolis multicolor Rothschild; 1920 : 131.
Automolis multicolor Rothschild; 1921 : 369, pl. 52a.

Idalus noiva (Dukinfield-Jones) comb. n.

Automolis noiva Dukinfield-Jones, 1914 : 11, pl. 1, fig. 14. LECTOTYPE ♀, BRAZIL: São Paulo, Alto de Serra, Santos, 800 m, 11.xii.1912 (*Jones*) (BMNH), here designated [examined].
Automolis noiva Dukinfield-Jones; Strand, 1919 : 21.
Automolis noiva Dukinfield-Jones; Hampson, 1920 : 152.

Automolis noiva Dukinfield-Jones; Seitz, 1921 : 368, pl. 50h [forewing should be white, except for costal area].
Rhipha noiva Dukinfield-Jones; Rego-Barros, 1962 : 40.

Idalus perlineosa (Rothschild) sp. rev., comb. n.

Automolis perlineosa Rothschild, 1917 : 480. LECTOTYPE ♀, Costa Rica: Juan Viñas, i. (BMNH), here designated [examined].
[*Automolis lineosa* (Walker); Hampson, 1920 : 166. Partim: incorrect synonymy with *lineosa*.]

Idalus sublineata (Rothschild) comb. n.

Automolis sublineata Rothschild, 1917 : 480. Holotype ♂, Peru: Carabaya, Tinguri, 3400 ft, viii.1904 (*Ockenden*) (BMNH) [examined].
[*Automolis lineosa* Walker; Hampson, 1920 : 166. Partim: incorrect synonymy with *lineosa*.]
Automolis sublineata Rothschild; Seitz, 1921 : 374, pl. 52d [inaccurate fig.; plate labelled *lineosa* Walker is a better representation of *sublineata* except for hindwings which should be yellowish white].

Idalus tybris (Cramer) comb. n.

Phalaena tybris Cramer, 1776 : 145, 154, pl. 92, fig. D [♂, poor fig.]. Type(s), Surinam [not examined].
Empusa tybris (Cramer) Hübner, [1819*b*] : 170.
Eucyrta tybris (Cramer) Kirby, 1892 : 171.
Automolis tybris (Cramer) Hampson, 1901 : 60.
Automolis troias Druce, 1903 : 197. LECTOTYPE ♀, Brazil: Rio Grande do Sul (BMNH), here designated [examined]. Synonymized by Hampson, 1920 : 167.
Automolis tybris (Cramer); Strand, 1919 : 26.
Automolis tybris (Cramer); Hampson, 1920 : 167.
Automolis tybris (Cramer); Seitz, 1921 : 376, pl. 52g [♀].

Idalus vitrea (Cramer) comb. n.

Empusa vitrea (Cramer) Hübner, [1819*b*] : 170.
Eucyrta vitrea (Cramer) Kirby, 1892 : 171.
Automolis vitrea (Cramer) Hampson, 1901 : 59, fig. 46 [♂, head, pattern, venation].
Automolis vitrea (Cramer); Strand, 1919 : 26.
Automolis vitrea (Cramer); Seitz, 1921 : 375, pl. 52g.

Subspecies ***Idalus vitrea vitrea*** (Cramer)

Phalaena vitrea Cramer, [1780] : 151, 176, pl. 276, fig. C [probably a ♂]. Type(s), Surinam [not examined].

Subspecies ***Idalus vitrea borealis*** (Rothschild) **comb. n.**

Automolis vitrea borealis Rothschild, 1910*a* : 47, pl. 7, fig. 3. LECTOTYPE ♂, Mexico: Orizaba, i.1896 (*Schaus*) (BMNH), here designated [examined].
Automolis vitrea borealis Rothschild; Seitz, 1921 : 376, pl. 52h.

Subspecies ***Idalus vitrea meridionalis*** (Rothschild) **comb. n.**

Automolis vitrea meridionalis Rothschild, 1910*a* : 47, pl. 7, fig. 1. LECTOTYPE ♂, Paraguay: Sapucay, 25.v.1902 (*Foster*) (BMNH), here designated [examined].
Automolis vitrea meridionalis Rothschild; Seitz, 1921 : 376, pl. 52h.

Subspecies ***Idalus vitrea occidentalis*** (Rothschild) **comb. n.**

Automolis vitrea occidentalis Rothschild, 1910*a* : 47, pl. 7, fig. 4. LECTOTYPE ♂, PERU: Carabaya, R. Huacamayo, La Union, 2000 ft, xi.1904 (*Ockenden*) (BMNH), here designated [examined].
Automolis vitrea occidentalis Rothschild; Seitz, 1921 : 376.

Idalus vitreoides (Rothschild) comb. n.

Automolis vitreoides Rothschild, 1922 : 476. Holotype ♂ [stated by Rothschild, 1922 : 476, to be from Trinidad but the holotype is labelled [BRAZIL] Pará (*Moss*) (BMNH) [examined]].

MACHAERAPTENUS Schaus

Machaeraptenus Schaus, 1894 : 228. Type-species: *Machaeraptenus ventralis* Schaus, 1894 : 229.
[*Automolis* Hübner sensu Hampson, 1901 : 39, et auctorum. Partim.]
Machaeraptenus Schaus; Travassos, 1943 : 457.
Machaeraptenus Schaus; Travassos, 1944 : 442.
Machaeraptenus Schaus; Watson, 1971 : 6, 95.

One species is transferred here from *Automolis*; another nominal species is simultaneously transferred from *Automolis* and synonymized with *ventralis*.

Machaeraptenus crocopera (Schaus) comb. n.

Automolis crocopera Schaus, 1905 : 218. Holotype ♂, GUYANA: Omai (USNM) [examined].
Automolis crocopera Schaus; Strand, 1919 : 16.
Automolis crocopera Schaus; Hampson, 1920 : 162, fig. 69 (venation, head).
Automolis crocopera Schaus; Seitz, 1921 : 372. [No fig.]
Automolis crocopera Schaus; Watson, 1971 : 26, pls 65 (type), 199a, b (genitalia).

Machaeraptenus ventralis Schaus

Machaeraptenus ventralis Schaus, 1894 : 229. Lectotype ♂, VENEZUELA: Aroa (USNM), designated by Watson, 1971 : 95 [examined].
Automolis ventralis (Schaus) Hampson, 1901 : 45, fig. 40 (pattern, venation, head).
Automolis sordidipennis Rothschild, 1916 : 266. LECTOTYPE ♀, VENEZUELA: Las Quiguas, near San Esteban (*Klages*), here designated [examined]. **Syn. n.**
Automolis sordidipennis Rothschild; Hampson, 1920 : 144, pl. 45, fig. 20.
Automolis sordidipennis Rothschild; Seitz, 1921 : 372, pl. 51g [grossly inaccurate].
Machaeraptenus ventralis Schaus; Travassos, 1943 : 457.
Machaeraptenus ventralis Schaus; Travassos, 1944 : 443, figs 11 (♂), 12–20 (venation and genitalia).
Machaeraptenus ventralis Schaus; Watson, 1971 : 95, pls 17b (type), 106c, d (genitalia).

ORMETICA Clemens

Ormetica Clemens, 1860 : 544. Type-species: *Ormetica sphingiformis* Clemens, 1860 : 545, by monotypy.
[*Rhipha* Walker sensu Travassos, 1943 : 457. Partim.]
[*Automolis* Hübner sensu Seitz, 1921 : 365. Partim.]
Ormetica Clemens; Watson, 1971 : 7. [Types of 19 species illustrated.]

Ormetica was re-established by Watson (1971) to accommodate a fairly homogenous group of yellow, dark brown and iridescent blue moths. There seems to be no justification for the synonymy of *Ormetica* with *Rhipha* by Travassos (1943 : 457), the type-species of which (*Rhipha strigata* Walker) is a distinctively marked, mostly black and white species. Another 27 nominal species and two subspecies are transferred here from *Automolis* to *Ormetica*.

Four species of *Ormetica* were studied by Blest (1964): *pauperis* Schaus, *sicilia* Druce, *metallica* and *taeniata* Guérin-Méneville. In response to handling, each of them responded with the type of display in which the wings are alternately raised and lowered and the abdomen raised, and except for *pauperis*, had a high or very high threshold for sound production. All were rejected as food either by fowl or *Cebus* monkeys.

The males of most of the *Ormetica* species available for study in the BMNH have an androconial zone interacting with hair-scales in a pouch formed by the folded anal area on the under surface of the hind wing. Only *chrysomelas*, *pallidifascia* and *pauperis* were found to lack this scent distributing organ, although it may also be lacking in the species *pretiosa* Schaus and *valera* Schaus which are not represented in the collection but are probably closely allied to *chrysomelas*.

Ormetica abdalsan (Schaus) **comb. n.**

Automolis abdalsan Schaus, 1920 : 116. Holotype ♂, Guatemala: Cayuga, x (USNM) [examined].
Automolis abdalsan Schaus; Watson, 1971 : 8, pls 27a (type), 122c, d (genitalia).

Ormetica albimaculifera (Hampson) **comb. n.**

Automolis albimaculifera Hampson, 1901 : 54, pl. 36, fig. 18. Holotype ♂, Brazil: Amazonas, Manicoré (BMNH) [examined].
Automolis albimaculifera Hampson; Strand, 1919 : 14.
Automolis albimaculifera Hampson; Seitz, 1921 : 367, pl. 50g.

Ormetica chrysomelas (Walker) **comb. n.**

Automolis chrysomelas Walker, 1856 : 1636. LECTOTYPE ♀, Brazil (UM, Oxford), here designated [examined].
Eucyrta geometrica Felder, 1874 : Heft 4, explanation to pls 75–107, pl. 102, fig. 6. LECTOTYPE ♂, French Guiana (BMNH), here designated [examined].
Euplesia chrysomelas (Walker) Kirby, 1892 : 168.
Automolis chrysomelas Walker; Hampson, 1901 : 53. [Synonymy of *geometrica* Felder.]
Automolis chrysomelas Walker; Strand, 1919 : 15.
Automolis chrysomelas Walker; Seitz, 1921 : 367, pl. 50f [distal yellow marking should be much closer to costal margin of wing].
Automolis chrysomelas f. *interrupta* Reich, 1937 : 70. Syntypes 2 ♂, Brazil: Joinville and New Bremen (Reich coll.: Israel) [not examined]. [An infra-subspecific name.]
Automolis chrysomelas f. *interrupta* Reich; Reich, 1938*a* : fig. 5.
Automolis chrysomelas f. *interrupta* Reich; Reich, 1938*b* : 205.

Ormetica codasi (Jörgensen) comb. n.

Automolis codasi Jörgensen, 1935 : 110, pl. 3, fig. 22. Syntypes ♂ & ♀, PARAGUAY; Villarica (Jörgensen coll. & Museo Argentino de Ciencias Naturales, Buenos Aires) [not examined].

Ormetica collateralis (Hampson) comb. n.

Automolis collateralis Hampson, 1901 : 64. Holotype ♂, COLOMBIA (BMNH) [examined].
Automolis collateralis Hampson; Strand, 1919 : 16.
Automolis collateralis Hampson; Seitz, 1921 : 367, pl. 50f [forewing outer margin should be light brown, and orange marking more yellowish].

Ormetica contraria (Walker) comb. n.

Automolis contraria (Walker) Butler, 1876 : 421.
Automolis contraria (Walker); Butler, 1877 : 45, pl. 9, fig. 9.
Euplesia contraria (Walker) Kirby, 1892 : 167.
Automolis contraria (Walker); Hampson, 1901 : 61.
Automolis contraria (Walker); Strand, 1919 : 16.
Automolis contraria (Walker); Seitz, 1921 : 367, pl. 50g [white apical marking of forewing should be more elongate, as in *sicilia* (50f)].

Subspecies ***Ormetica contraria contraria*** (Walker)

Euchromia contraria Walker, 1854*a* : 259. Holotype ♂, BRAZIL: Amazonas, Ega [Teffé] (*Bates*) [examined].

Subspecies ***Ormetica contraria peruviana*** (Rothschild) comb. n.

Automolis contraria peruviana Rothschild, 1922 : 487. Holotype ♀, PERU: Carabaya, Rio Huacamayo, La Union, 2000 ft, xii.1904 (*Ockenden*) (BMNH) [examined].

Ormetica flavobasalis (Gaede) comb. n.

Automolis flavobasalis Gaede, 1923 : 3. Holotype ♂, BOLIVIA: 'Rio Juntas', 1000 m, 1890 (*Garlepp*) (MNHU) [examined].

Ormetica fulgurata (Butler) comb. n.

Automolis fulgurata Butler, 1876 : 420. Lectotype ♀, 'Espiritu Santo' (*Higgins*) (BMNH), designated by Butler, 1877 : 46 [examined]. The stated type-locality 'Espiritu Santo' may be Bolivian but the lectotype is labelled Espirito Sto [BRAZIL] and is entered in the BMNH registration book as from Brazil.
Automolis fulgurata Butler; Butler, 1877 : 46, pl. 18, fig. 5.
Euplesia fulgurata (Butler) Kirby, 1892 : 167.
Automolis fulgurata Butler; Hampson, 1901 : 53.
Automolis fulgurata Butler; Strand, 1919 : 18.
Automolis fulgurata Butler; Seitz, 1921 : 366, pl. 50e [orange coloration should be more yellowish and patagia dark brown medially].

Ormetica latania (Druce) comb. n.

Euplesia latania (Druce) Kirby, 1892 : 167.
Automolis latania Druce; Hampson, 1901 : 56.

Automolis latania Druce; Strand, 1919 : 20.
Automolis latania Druce; Seitz, 1921 : 367, pl. 50f.

Subspecies ***Ormetica latania latania*** (Druce)

Automolis latania Druce, 1890 : 495, pl. 42, fig. 2. LECTOTYPE ♀, Colombia: 'interior of' (*Carder*) (BMNH), here designated [examined].

Subspecies ***Ormetica latania vulcanica*** (Seitz) **comb. n.**

Automolis latania form *vulcanica* Seitz, 1921 : 367, pl. 50f. LECTOTYPE ♂, Costa Rica: Irazu Volcano, 1200 m (*Fassl*), here designated (BMNH) [examined].

Ormetica melea (Druce) comb. n.

Automolis melea Druce, 1900 : 66. LECTOTYPE ♂, Venezuela: Mérida (*Briceno*) (BMNH), here designated [examined].
Automolis melea Druce; Hampson, 1901 : 58, pl. 43, fig. 1.
Automolis melea Druce; Strand, 1919 : 21.
Automolis melea Druce; Seitz, 1921 : 367, pl. 50e [orange coloration should be more yellowish].

Ormetica metallica (Joicey & Talbot) comb. n.

Automolis metallica Joicey & Talbot, 1916 : 57, pl. 14, fig. 7. Holotype ♂, Panama: Chiriqui (BMNH) [examined].
Automolis metallica Joicey & Talbot; Hampson, 1920 : 149.
Automolis metallica Joicey & Talbot; Seitz, 1921 : 366, pl. 50c [inaccurate fig.].

Ormetica ochreomarginata (Joicey & Talbot) comb. n.

Automolis ochreomarginata Joicey & Talbot, 1917 : 267, pl. 1, fig. 9. Holotype ♂, French Guiana: St Jean du Maroni (BMNH) [examined].
Automolis ochreomarginata Joicey & Talbot; Hampson, 1920 : 168.
Automolis ochreomarginata Joicey & Talbot; Seitz, 1921 : 367. [No fig.]

Ormetica packardi (Butler) comb. n.

[*Euchromia sypilus* Cramer sensu Walker, 1854 : 260. Misidentification.]
Automolis packardi Butler, 1876 : 420. LECTOTYPE ♂, Brazil: Pará (*Bates*) (BMNH), here designated [examined].
Euplesia packardi (Butler) Kirby, 1892 : 167.
Automolis packardi Butler; Hampson, 1901 : 56, pl. 36, fig. 19.
Automolis packardi Butler; Strand, 1919 : 21.
Automolis packardi Butler; Seitz, 1921 : 366, pl. 50c.

Ormetica pallidifascia (Rothschild) comb. n.

Automolis pallidifascia Rothschild, 1933 : 170. LECTOTYPE ♂, Brazil: São Paulo, 'Alto da Sierra', viii.1924 (*Spitz*) (BMNH), here designated [examined].

Ormetica pallidinervis (Rothschild) comb. n.

Automolis pallidinervis Rothschild, 1935 : 241. Holotype ♂, Brazil: Sta Catarina, 'Hansa Humboldt', viii.1932 (*Maller*) (BMNH) [examined].

Ormetica pratti (Druce) comb. n.

Automolis pratti Druce, 1900 : 66. LECTOTYPE ♂, COLOMBIA: (*Pratt*) (BMNH), here designated [examined].
Automolis pratti Druce; Hampson, 1901 : 58, pl. 43, fig. 16.
Automolis pratti Druce; Strand, 1919 : 22.
Automolis pratti Druce; Seitz, 1921 : 357, pl. 50e [orange coloration should be much more yellowish and yellow streak deleted from base of forewing costa].

Ormetica pseudoguapisa (Rothschild) comb. n.

Automolis pseudoguapisa Rothschild, 1910*e* : 505. Holotype ♀, VENEZUELA: San Esteban, viii. [not vi. as stated in original description] 1909 (*Klages*) (BMNH) [examined].
Automolis pseudoguapisa Rothschild; Strand, 1919 : 22.
Automolis pseudoguapisa Rothschild; Hampson, 1920 : 165.
Automolis pseudoguapisa Rothschild; Seitz, 1921 : 366, pls 50d,e [patagia of ♀ should be dark brown medially].

Ormetica rosenbergi (Rothschild) comb. n., stat. n.

Automolis rosenbergi Rothschild, 1910*a* : 47, pl. 6, fig. 35. LECTOTYPE ♀, ECUADOR: Paramba (BMNH), here designated [examined].
Automolis rosenbergi Rothschild; Strand, 1919 : 23.
Automolis rosenbergi Rothschild; Hampson, 1920 : 158.
Automolis ataenia rosenbergi Rothschild; Seitz, 1921 : 366, pl. 50d [yellow band on forewing should taper distally].

Ormetica rothschildi nom. n.

Automolis packardi saturata Rothschild, 1910*a* : 47, pl. 6, fig. 33. Lectotype ♂, BRAZIL: Sta Catarina (BMNH), here designated by Hampson, 1920 : 159 [examined]. A junior primary homonym of *A. saturata* Walker, 1856: 1635. Here replaced by *rothschildi* nom. n.
Automolis packardi var. *saturata* Rothschild; Strand, 1919 : 22.
Automolis saturata Rothschild; Hampson, 1920 : 159.
Automolis saturata Rothschild; Seitz, 1921 : 366, pl. 50c.

Ormetica stenotis (Dognin) comb. n.

Automolis stenotis Dognin, 1908 : 158. Holotype ♂, FRENCH GUIANA: (USNM) [examined].
Automolis stenotis Dognin; Strand, 1919 : 24.
Automolis stenotis Dognin; Hampson, 1920 : 145, pl. 46, fig. 4 [antennae should be more densely bipectinate, costa of forewing less strongly arcuate, anal angle of hindwing more evenly rounded and abdomen much more yellowish].
Automolis stenotis Dognin; Seitz, 1921 : 372, pl. 51g [errors in Hampson (1920) figure are repeated].
Automolis stenotis Dognin; Watson, 1971 : 87, pls 30e (type), 128a,b (genitalia).

Ormetica sypalettius (Seitz) comb. n.

Automolis sypalettius, Seitz, 1921 : 366, pl. 50c [proximal and medial yellow markings on forewing should be continuous]. LECTOTYPE ♂, COLOMBIA: Villavicencio, 400 m (*Fassl*) (BMNH), here designated [examined].

Ormetica sypilus (Cramer) **comb. n.**

Sphinx sypilus Cramer, [1777] : 4, 151, pl. 99, fig. A. Type(s) Surinam [not examined].
Automolis saturata Walker, 1856 : 1635. LECTOTYPE ♂, Brazil: Pará (UM), here designated [examined]. **Syn. n.**
Automolis sypilus (Cramer) Walker, 1856 : 1637.
Eucyrta praetexta Felder, 1874 : 4, pl. 102, fig. 5. LECTOTYPE ♂, Brazil: R. Amazon (*Bates*) (BMNH), here designated [examined]. [Synonymized with *saturata* Walker by Hampson, 1901 : 24.]
Euplesia sypilus (Cramer) Kirby, 1892 : 167.
Prumala saturata (Walker) Hampson, 1901 : 24.
Automolis sypilus (Cramer); Hampson, 1901 : 57.
Automolis sypilus (Cramer); Rothschild, 1910*a* : 43 [description of ♂].
Prumala saturata (Walker); Strand, 1919 : 8.
Automolis sypilus (Cramer); Strand, 1919 : 25.
Prumala saturata (Walker); Seitz, 1921 : 345, pl. 449 [inaccurate fig., particularly in coloration of forewing].
Automolis sypilus (Cramer); Seitz, 1921 : 366, pl. 50c [inaccurate and misleading fig.]. [Description of larva and pupa.]

Ormetica tanialoides (Rothschild) **comb. n.**

Automolis tanialoides Rothschild, 1910*e* : 504. LECTOTYPE ♂, Venezuela: San Esteban, viii.1909 [not vi.] (*Klages*) (BMNH), here designated [examined].
Automolis tanialoides Rothschild; Hampson, 1920 : 163.
Automolis tanialoides Rothschild; Seitz, 1921 : 367, pl. 50e [orange markings should be much more yellowish, costa of forewing should be without dark brown proximally and dark brown outer-marginal band should be half the figured width].

Ormetica triangularis (Gaede) **comb. n.**

Automolis triangularis Gaede, 1928 : 28. Holotype ♀, Colombia: W., between Tumaco and Pasto (*Niepelt*) (MNHU) [examined].

Ormetica underwoodi (Rothschild) **comb. n.**

Automolis underwoodi Rothschild, 1910*a* : 47. LECTOTYPE ♂, Costa Rica: (*Underwood*), here designated [examined].
Automolis underwoodi Rothschild; Strand, 1919 : 26.
Automolis underwoodi Rothschild; Hampson, 1920 : 158.
Automolis underwoodi Rothschild; Seitz, 1921 : 366, pl. 50d [the lateral abdominal markings should be yellow, not orange].

Ormetica zenzeroides (Butler) **comb. n.**

Automolis zenzeroides Butler, 1877 : 46, pl. 16, fig. 8 [inaccurate fig.]. LECTOTYPE ♂, Brazil: Amazonas, R. Juruá, 3.x.1874 (*Trail*) (BMNH), here designated [examined].
Euplesia zenzeroides (Butler) Kirby, 1892 : 27.
Automolis zenzeroides Butler; Hampson, 1901 : 61.
Automolis zenzeroides Butler; Seitz, 1921 : 367, pl. 50g [inaccurate fig.: the dark apical marking on the forewing should enclose two white dashes; one parallel to veins, the other proximal and about 45 degrees to the first].

PARANERITA Hampson

Paranerita Hampson, 1901 : 439. Type-species: *Evius polyxenus* Druce, 1883 : 383, by original designation.
Paranerita Hampson; Strand, 1919 : 308.
Paranerita Hampson; Hampson, 1920 : ix, 79.
Paranerita Hampson; Seitz, 1921 : 354.
Paranerita Hampson; Watson, 1971 : 7.

As indicated by Seitz (1921 : 355) there is considerable doubt as to whether the species at present grouped under *Paranerita* merit generic separation. This and related nominal genera are in need of taxonomic reappraisal.

Paranerita hyalinata (Reich) **comb. n.**

Automolis hyalinata Reich, 1933 : 282, fig. 5. Holotype ♀, PERU: E., Huayabamba (Reich collection, Israel) [examined].

The placement here of *hyalinata* should be regarded as tentative. Males are needed before the generic affinities of this species can be assessed accurately.

PHAEOMOLIS Hampson

Phaeomolis Hampson, 1901 : 20. Type-species: *Neritos obscurata* Butler, 1877 : 51, by original designation.
Phaeomolis Hampson; Strand, 1919 : 6.
Phaeomolis Hampson; Seitz, 1922 : 381.
Phaeomolis Hampson; Watson, 1971 : 7. [Types of 9 species illustrated.]

Phaeomolis lineatus (Druce) **comb. n.**

Evius lineatus Druce, 1884 : 89, pl. 9, fig. 17. Holotype ♂, PANAMA: San Lorenzo (*Champion*) (BMNH) [examined].
Idalus lineatus (Druce) Hampson, 1901 : 15.
Idalus lineatus (Druce); Strand, 1919 : 5.
Idalus lineatus (Druce); Seitz, 1921 : 349, pl. 45d [inaccurate, see fig. in Druce, 1884].
Automolis lineatus (Druce) Forbes, 1939: 203. Partim. [Incorrect synonymy of *Agaraea internervosa* (Dognin), 1912, see Watson, 1971 : 47.]

This species was studied by Blest (1964—as *Automolis lineatus* (Druce)). He found that it responded to tactile stimuli with reflex immobilization (Blest, 1957) and had a low to medium threshold for sound production. It was rejected by *Cebus* monkeys as a food source.

PRYTERIA Möschler

Pryteria Möschler, 1882 : 335. Type-species: *Pryteria costata* Möschler, 1882 : 336, by monotypy.

Since Kirby's catalogue (1892 : 172) the genus *Pryteria* seems to have been ignored. Hampson (1901 : 514) refers to *Pryteria costata* in his list of unrecognized

species. Subsequent to this, *costata* has been placed in *Automolis* Hübner, [1819] by various authors without listing *Pryteria* as a synonym of the latter.

The eight nominal species now included in *Pryteria* and catalogued here are all transferred from *Automolis*.

Pryteria alboatra (Rothschild) stat. rev., comb. n.

Automolis alboatra Rothschild; Strand, 1919 : 14.
Automolis alboatra Rothschild; Hampson, 1920 : 156.
Automolis unifascia alboatra Rothschild; Seitz, 1921 : 374, pl. 52e.

Subspecies ***Pryteria alboatra alboatra*** (Rothschild)

Automolis alboatra Rothschild, 1910*a* : 46, pl. 6, fig. 30. Lectotype ♂, Brazil: Amazonas, Fonte Boa, vii.1906 (*Klages*) (BMNH), designated by Hampson, 1920 : 156 [examined].

Subspecies ***Pryteria alboatra borussica*** Seitz **comb. n.**

Automolis unifascia form *borussica* Seitz, 1921 : 374, pl. 52e. LECTOTYPE ♂, Bolivia: Rio Songo, 750 m (*Fassl*) (BMNH), here designated [examined].

Subspecies ***Pryteria alboatra intensa*** Rothschild **comb. n.**

Automolis alboatra intensa Rothschild, 1935 : 240. Holotype ♂, Costa Rica: (*Underwood*) (BMNH) [examined].

Pryteria apicata (Schaus) comb. n.

Automolis apicata Schaus, 1905 : 218. Holotype ♂, French Guiana: St Laurent, Maroni River (USNM) [examined].
Automolis apicata Schaus; Strand, 1919 : 14.
Automolis apicata Schaus; Hampson, 1920 : 175, pl. 47, fig. 9.
Automolis apicata Schaus; Seitz, 1921 : 374, pl. 52f.
Automolis apicata Schaus; Watson, 1917 : 13, pls 31b (type), 129a, b (genitalia).

Pryteria apicella (Strand) comb. n.

Automolis apicalis Rothschild, 1910*a* : 46. Holotype ♀, Bolivia: 10 miles above Mapiri, 2000 ft, 1895 (*Stuart*) [examined]. [Junior homonym of *Automolis apicalis* Walker, 1854 : 261.]
Automolis semicostalis var. *apicalis* Rothschild, 1910*c* : 26.
Automolis apicella Strand, 1919 : 14. [Replacement name for *apicalis* Rothschild.]
Automolis albiapicalis Hampson, 1920 : 157, pl. 46, fig. 18. [Unnecessary replacement name for *apicalis* Rothschild.]
Automolis apicella Strand; Seitz, 1921 : 375, pl. 52f.

Pryteria colombiana (Rothschild) comb. n.

Automolis colombiana Rothschild, 1937 : 171. LECTOTYPE ♂, Colombia: W., 'Bella Vista', viii.1927 (BMNH), here designated [examined].

[The lectotype bears a label '*Automolis orientalis* Rothsch. Type' in Rothschild's handwriting, a name which was not published and clearly abandoned by the author in favour of *colombiana*. Both lectotype and paralectotype stood over a label '*colombiana*' in the Rothschild collection.]

Pryteria costata Möschler **comb. n.**

Pryteria costata Möschler, 1882 : 336, pl. 18, fig. 27. Holotype ♀, SURINAM: Paramaribo (depository not known) [not examined].
Pryteria costata Möschler; Hampson, 1901 : 514 [in Hampson's 'List of unrecognized species'].
Automolis costata (Möschler) Strand, 1919 : 16.
Automolis costata (Möschler); Gaede, 1923 : 3. Partim. [Synonymy of *semicostalis* Rothschild.]
Automolis costata form *nigroapicalis* Gaede, 1923 : 3. Holotype ♀, SURINAM: (MNHU) [examined].

Pryteria hamifera (Dognin) **comb. n.**

Automolis hamifera Dognin, 1907 : 227. Holotype ♂, FRENCH GUIANA: St Laurent, Maroni River (USNM) [examined].
Automolis hamifera Dognin; Strand, 1919 : 19.
Automolis hamifera Dognin; Hampson, 1920 : 162, pl. 46, fig. 22.
Automolis hamifera Dognin; Seitz, 1921 : 374. pl. 52e [pale area of wing too yellowish].
Automolis hamifera Dognin; Watson, 1971 : 42, pls 31a (type), 128e,f (genitalia).

Pryteria semicostalis (Rothschild) **comb. n.**

Automolis semicostalis Rothschild, 1910*a* : 46, pl. 6, fig. 31. LECTOTYPE ♂, BRAZIL: Amazonas, Fonte Boa, xi.1906 (*Klages*) (BMNH), here designated [examined]. [Both syntypes are ♀; not ♂ and ♀ respectively as indicated by Rothschild.]
Automolis semicostalis Rothschild; Strand, 1919 : 24.
Automolis semicostalis Rothschild; Hampson, 1920 : 157, pl. 46, fig. 19 [pale areas of forewing should be white].
Automolis semicostalis Rothschild; Seitz, 1921 : 375, pl. 52f.
[*Automolis costata* Möschler; Gaede, 1923 : 3. Partim. Synonymy of *semicostalis*.]

Pryteria unifascia (Druce) **comb. n.**

Automolis unifascia (Druce) Hampson, 1901 : 66, pl. 36, fig. 20.
Automolis unifascia (Druce); Strand, 1919 : 26.
Automolis unifascia (Druce); Seitz, 1921 : 374, pl. 52e.
Automolis unifascia form *ilicis* Jörgensen, 1932 : 53. Holotype ♀, PARAGUAY: Villarica (depository not known) [not examined].

Subspecies ***Pryteria unifascia unifascia*** (Druce)

Sallaea unifacia Druce, 1899 : 466. LECTOTYPE ♂, GUYANA: 'Demerara' (UM), here designated [examined].

Subspecies ***Pryteria unifascia tenuis*** (Rothschild) **comb. n.**

Automolis unifascia tenuis Rothschild, 1935 : 240. Holotype ♀, BELIZE: Rio Grande, ix.1932 (*White*) (BMNH) [examined].

RHIPHA Walker

Rhipha Walker, 1854 : 273. Type-species: *Euchromia strigosa* Walker, 1854 : 273, by monotypy.
[*Automolis* Hübner sensu Hampson, 1901 : 39, et auctorum. Partim.]
Rhipha Walker sensu Travassos, 1943 : 457. [Synonymy of *Apyre* Walker, *Ormetica* Clemens and *Cratoplastis* Felder.]
Rhipha Walker; Watson, 1971 : 7, 9, 22, 51. [Types of 3 species illustrated.]

Ormetica and *Cratoplastis* were subsequently re-established by Watson (1971). *Apyre* Walker (1854*b* : 490) is here re-established as a monotypic genus (type-species: *Apyre separata* Walker, 1854*b* : 491) **gen. rev.**

The species *uniformis* Rothschild listed below shares many characters with the type-species of *Rhipha*. The remaining eight species are transferred from *Automolis* to *Rhipha* because they have close relatives in the latter, although there is little doubt that they are incorrectly classified. I have hesitated to erect new genera for these wrongly placed species as the affinities of other possibly closely related species at present in other genera should first be investigated.

One species, *chionoplaga* Dognin, was studied by Blest (1964). In response to tactile stimuli it had a high threshold for sound production and exhibited the type of display in which the wings are alternately raised and lowered and the abdomen raised. It was rejected by *Cebus* monkeys as a food source.

Rhipha flammula (Hayward) comb. n.

Automolis flammula Hayward, 1947 : 64, figs a, b, e. Syntypes, 5 ♂, ARGENTINA: Chaco National Territory, Fontana, bred from pupae received ix.1944 (Instituto Miguel Lillo) [not examined].

This nominal species may be the same as *fulminans*, known only from the female lectotype. The species represented by Hayward (1947) in fig. c is probably *subflammans* Rothschild, not *fulminans* as labelled by Hayward.

Rhipha fulminans (Rothschild) comb. n.

Automolis fulminans Rothschild, 1916 : 266. LECTOTYPE ♀, BRAZIL: south (BMNH), here designated [examined].

Automolis fulminans Rothschild; Hampson, 1920 : 154, pl. 65, fig. 21 [inaccurate, but useful guide].

Automolis subflammans form *fulminans* Rothschild; Seitz, 1921 : 371, pl. 51d [poor copy of Hampson's figure].

The nominal species *flammans* Hampson and *subflammans*, which are doubtless closely allied to *fulminans*, were transferred to *Rhipha* by Travassos (1955 : 101). None of these species is congeneric with the type-species of *Rhipha*, but further studies need to be carried out before they and other species similarly transferred in this paper can be placed satisfactorily in existing genera or new genera are erected for them.

Rhipha luteoplaga (Rothschild) comb. n.

Automolis luteoplaga Rothschild, 1922 : 477. Holotype ♂, BRAZIL: Pará (*Moss*) (BMNH) [examined].

This nominal species is transferred here from *Automolis*, together with *persimilis* (q.v.), because of the similarities between them and *Rhipha flavoplagiata* (Rothschild). The latter, which has some male genitalic features in common with the

attenuated male genitalia of *luteoplaga* and *persimilis*, was transferred to *Rhipha* in a paper by Travassos (1952 : 55). It is doubtful whether any of these nominal species can be considered congeneric with the type-species of *Rhipha*.

Rhipha mathildae (Köhler) **comb. n.**

Automolis mathildae Köhler, 1924 : 16, pl. 1, fig. 2 (venation), pl. 6, fig. 11 (pattern). Type(s), ARGENTINA: Misiones (depository not known) [not examined].
Automolis mathildae Köhler; Hayward, 1947 : 67, fig. d.

This is not taxonomically distant from *Rhipha flammans*.

Rhipha perflammans (Dognin) **comb. n.**

Automolis perflammans Dognin, 1914 : 16. Holotype ♂, FRENCH GUIANA: Maroni River (USNM) [examined].
Automolis 'postflammans' Dognin; Strand, 1919 : 22. Incorrect subsequent spelling.
Automolis perflammans Dognin; Hampson, 1920 : 155.
Automolis perflammans Dognin; Seitz, 1921 : 371, pl. 51e [tegulae should be white anteriorly; there should be a pair of white spots immediately posterior to patagia mid-dorsally and a single white spot on mesoscutellum; the red costal area of the forewing should be more brownish, and the white terminal spots should be larger].

Transferred to *Rhipha* for reasons mentioned under *Rhipha fulminans*.

Rhipha persimilis (Rothschild) **comb. n.**

Automolis persimilis Rothschild; Strand, 1919 : 22.
Automolis persimilis Rothschild; Seitz, 1921 : 372, pl. 51h (*'persimiles'*) [inaccurate but useful fig.].

Subspecies ***Rhipha persimilis persimilis*** (Rothschild)

Automolis persimilis Rothschild, 1910*a* : 44, pl. 6, fig. 25. LECTOTYPE ♂, PERU: R. Inambari, La Oroya, ix.1904, 3100 ft (*Ockenden*) (BMNH), here designated [examined].

Subspecies ***Rhipha persimilis marginata*** (Rothschild) **comb n.**

Automolis persimilis marginata Rothschild, 1910*a* : 45, pl. 16, figs 22, 23. LECTOTYPE ♂, COSTA RICA: Tuis (BMNH), here designated [examined].
Automolis persimilis marginata Rothschild; Seitz, 1921 : 372, pl. 51h [inaccurate, but useful guide].

The reasons for placing this species in *Rhipha* are discussed under *Rhipha luteoplaga*.

Rhipha pulcherrima (Rothschild) **comb. n.**

Automolis pulcherrima Rothschild, 1935 : 240. Holotype ♂, BRAZIL: Amazonas, 'Goyaz', Vianópolis, xii.1931 (*Spitz*) (BMNH) [examined].
Automolis pulcherrima Rothschild, 1937 : 144 [♀ description].
Rhipha olafi Gagarin, 1967 : 11, fig. 1. Holotype ♂, BRAZIL: Brasilia, Sta Maria, 1150 m, 3.iii.1963 [not examined]. **Syn. n.**

Placed in *Rhipha* for the reason given under *Rhipha fulminans*.

Rhipha uniformis (Rothschild) **comb. n.**

Automolis uniformis Rothschild, 1910*a* : 42, pl. 6, fig. 26. Holotype ♂, SURINAM: Maroewym Valley, Aroewarwa Creek, iv.1905 (*Klages*) (BMNH) [examined].
Automolis uniformis Rothschild; Strand, 1919 : 26.
Automolis uniformis Rothschild; Hampson, 1920 : 172.
Automolis uniformis Rothschild; Seitz, 1921 : 372, pl. 51h [dorsal surface of patagia should be brownish grey, not yellow].
Automolis uniformis ab. *mesoleuca* Seitz, 1921 : 372, pl. 51h [dorsal surface of patagia should be brownish grey, not yellow]. Type(s), BOLIVIA: Rio Songo, 750 m (*Fassl*) (1 ♀ syntype in BMNH) [examined].

This is one of the few species at present placed in *Rhipha* which is probably conspecific with its type-species.

Rhipha vivia **nom. n.**

Automolis spitzi Rothschild, 1937 : 144. LECTOTYPE ♂, BRAZIL: Amazonas, 'Goyaz'. Leopoldo dul Bulhoes, iii.1936 (*Spitz*) (BMNH), here designated [examined]. A junior primary homonym of *Automolis spitzi* Rothschild, 1935 : 241. Here replaced by *vivia* nom. n.

Placed in *Rhipha* for the reason given under *Rhipha fulminans*.

SCAPTIUS Walker

Scaptius Walker, 1855 : 642. Type-species: *Scaptius ditissimus* Walker, 1855 : 643, by monotypy.
[*Automolis* Hübner sensu Hampson, 1901 : 39, et auctorum. Partim.]
Scaptius Walker; Travassos, 1943 : 456, 457. [Re-establishment of genus.]
Scaptius Walker; Watson, 1971 : 7, 23, 65, 84. [Types of 3 species illustrated.]

Nine nominal species are here transferred from *Automolis* to *Scaptius*.

Two species, *vinasia* Schaus and *obscurata* Schaus [then placed in *Automolis*], were studied by Blest (1964); the former species from only two specimens. In response to handling, the latter exhibited either 'reflex immobilization' or the display in which the wings are alternately raised and lowered and the abdomen raised, and had a low threshold for sound production. It was apparently palatable to laboratory 'predators' (*Cebus* monkeys and fowl). If this cryptically pattered species is generally palatable to natural predators, its active form of display can be considered a Batesian mimetic copy of unpalatable species of genera such as *Ormetica* and *Viviennea* in which the same type of display occurs.

Scaptius asteroides (Schaus) **comb. n.**

Automolis asteroides Schaus, 1905 : 214. Holotype ♂, FRENCH GUIANA: St Laurent, Maroni River (USNM) [examined].
Automolis asteroides Schaus; Strand, 1919 : 15.
Automolis asteroides Schaus; Hampson, 1920 : 133, fig. 59 (head; venation, pattern, androconial areas).

Automolis asteroides Schaus; Seitz, 1925 : 477.
Automolis asteroides Schaus; Watson, 1971 : 14, pls 346 (type), 133c,d (genitalia).

Scaptius chrysoperina (Gaede) comb. n.

Automolis chrysoperina Gaede, 1928 : 28. Holotype ♀, PANAMA: Chiriqui (MNHU) [examined].

The type is externally almost identical to that of *Scaptius obscurata* (Schaus) (see Watson, 1971 : 65, pl. 15e).

Scaptius ditissimus Walker comb. rev.

Scaptius ditissimus Walker, 1855 : 643. Holotype ♂, BRAZIL: Amazonas, Ega [Tefé] (*Bates*) [examined].
Automolis ditissima (Walker) Hampson, 1901 : 50.

Druce (1897 : 368, pl. 74, fig. 2) and Seitz (1921 : 369, pl. 51a) have both published figures which purport to represent *ditissimus*. In fact, the species illustrated is not *ditissimus* but is possibly *Hyponerita rhodocraspis* Hampson (1909 : 364).

The male of *ditissimus* may prove to be represented by the type of *Scaptius sordida* (Rothschild) (1910 : 25, pl. 4, fig. 18). Females of *Scaptius* appear to have a more extensive brown area on the forewing and to have dark hindwings; for example, the type of *ditissimus* and of *Scaptius chrysopera* (Schaus) (see Hampson, 1920 : 154, pl. 46, fig. 15, and Watson, 1971 : 23, pl. 15f) and *Scaptius obscurata* (Schaus) (see Watson, 1971 : 65, pl. 15e).

Scaptius ignivena (Joicey & Talbot) comb. n.

Automolis ignivena Joicey & Talbot, 1917 : 266, pl. 1, fig. 7. Holotype ♀, PERU: Tabaconas, Charape River, 4000 ft, 1912 (*Pratt*) (BMNH) [examined].
Automolis ignivena Joicey & Talbot; Hampson, 1920 : 153.
Automolis ignivena Joicey & Talbot; Seitz, 1921 : 370, pl. 53f [hardly recognizable; labelled '*nigrivena*', an incorrect subsequent spelling].

Scaptius neritosia (Dukinfield-Jones) comb. n.

Automolis neritosia Dukinfield-Jones, 1908 : 146. LECTOTYPE ♂, BRAZIL: Paraná, Castro, 950 m (BMNH), here designated [examined].
Automolis neritosia Dukinfield-Jones; Strand, 1919 : 21.
Automolis neritosia Dukinfield-Jones; Hampson, 1920 : 130, fig. 56 [head, venation, pattern, androconial areas].
Automolis neritosia Dukinfield-Jones; Seitz, 1921 : 370. [No fig.]

Scaptius pseudoprumala (Rothschild) comb. n.

Automolis pseudoprumala Rothschild, 1935 : 240. Holotype ♂, BRAZIL: Sta Catarina, 'Hansa Humboldt', viii.1932 (*Maller*) (BMNH) [examined].
Automolis prumaloides form *geminipunctata* Gaede, 1928 : 28. Holotype ♂, BRAZIL: Paraná (MNHU) [examined]. **Syn. n.**

Scaptius prumaloides (Rothschild) **comb. n.**

Automolis prumaloides Rothschild, 1910*a* : 38, pl. 5, fig. 38. Lectotype ♂, Brazil: Amazonas, Fonte Boa, v.1906 (*Klages*) (BMNH), designated by Hampson, 1920 : 134 [examined].
Automolis prumaloides Rothschild; Strand, 1919 : 22.
Automolis prumaloides Rothschild; Hampson, 1920 : 134.
Automolis prumaloides Rothschild; Seitz, 1921 : 375, pl. 52f.

Scaptius sordida (Rothschild) **comb. n.**

Prumala sordida Rothschild, 1910*a* : 25, pl. 4, fig. 18. Holotype ♂, Peru: Carabaya, Rio Huacamayo, La Union, 2000 ft, xi.1904 (*Ockenden*) (BMNH) [examined].
Prumala sordida Rothschild; Strand, 1919 : 8.
Automolis sordida (Rothschild) Hampson, 1920 : 139.
Automolis sordida (Rothschild); Seitz, 1921 : 375, pl. 52f [probably not this species].

As mentioned previously, the type of *sordida* may prove to be a male of *ditissimus* (q.v.)

Scaptius submarginalis (Rothschild) **comb. n.**

Prumala submarginalis Rothschild, 1910*a* : 24, pl. 4, fig. 16. Holotype ♂, Brazil: Minas Gerais, 19.x.1900 (*Kennedy*) (BMNH) [examined].
Prumala submarginalis Rothschild; Strand, 1919 : 8.
Automolis submarginalis (Rothschild) Hampson, 1920 : 138.
Automolis submarginalis (Rothschild); Seitz, 1921 : 375, pl. 52g [abdomen should be scarlet; forewing should be pinkish anally and have dark spot near midle of outer margin].

The type of *Scaptius obscurata* (Schaus) (see Watson, 1971 : pl. 15e) may prove to be a female of *submarginalis*.

Scaptius vinasia (Schaus) **comb. n.**

Automolis vinasia Schaus, 1910 : 201. Lectotype ♂, Costa Rica: Juan Viñas, vi.1909 (USNM), designated by Watson, 1971 : 96 [examined].
Automolis vinasia Schaus; Strand, 1919 : 26.
Automolis vinasia Schaus; Hampson, 1920 : 133, fig. 60 [head, venation, pattern, androconial areas].
Automolis vinasia Schaus; Seitz, 1921 : 374. [No fig.]
Automolis vinasia Schaus; Watson, 1971 : 96, pls 15d (type), 104c,d (genitalia).

SUTONOCREA Butler

Sutonocrea Butler, 1876 : [vii]. Type-species: *Creatonotos lobifer* Herrich-Schäffer, [1855], pl. 88, fig. 503 (wrapper), by monotypy.
[*Automolis* Hübner sensu Hampson, 1901: 39, et auctorum. Partim.]
Sutonocrea Butler; Travassos, 1943 : 456. [Re-establishment of genus.]
Sutonocrea Butler; Travassos, 1944*a* : 302. [Redescription.]

The species *Sutonocrea reducta* (Walker) [then in *Automolis*] was studied by Blest (1964). His experimental specimens responded to tactile stimuli with 'reflex immobilisation' and had a high threshold for sound production. *Cebus* monkeys rejected them in palatability tests.

Sutonocrea fassli (Dognin) comb. n.

Automolis fassli Dognin, 1910 : 7. Holotype ♂, Colombia: San Antonio, near Cali (*Fassl*) (USNM) [examined].
Automolis fassli Dognin; Strand, 1919 : 17.
Automolis fassli Dognin; Hampson, 1920 : 136, pl. 45, fig. 28.
Automolis fassli Dognin; Seitz, 1921 : 368, pl. 50g.
Automolis fassli Dognin; Watson, 1971 : 33, pls 17c (type), 107a-c (genitalia).

SYMPHLEBIA Felder

Symphlebia Felder, 1874 : 9. Type-species: *Symphlebia lophocampoides* Felder, 1874 : 9, pl. 102, fig. 1, by monotypy.
[*Prumala* Schaus sensu Hampson, 1901 : 21. Partim.]
Symphlebia Felder; Travassos, 1959 : 53. [Re-establishment of genus.]

The following three species are transferred from *Automolis* to *Symphlebia* as their most satisfactory placement pending a review of the relationships of the nominal genera *Symphlebia*, *Prumala* Schaus, *Lampruna* Schaus, *Neaxia* Hampson, *Amaxia* Walker, *Antaxia* Hampson and *Epimolis* Dyar.

Symphlebia dissimulata (Reich) comb. n.

Automolis dissimulata Reich, 1936 : 423. Holotype ♀, Brazil: São Paulo state, 'Serro do Cubatao (Serro do mar)', between Santos and São Paulo, 50–900 m (possibly in Reich collection, Israel) [not examined].

Symphlebia panema (Dognin) comb. n.

Automolis panema Dognin, 1923 : 5. Holotype ♂, Brazil: São Paulo, Paranapanema (USNM) [examined].
Automolis panema Dognin; Watson, 1971 : 69, pls 2a (type), 81a,b (genitalia).

Symphlebia rosa (Druce) comb. n.

Automolis rosa Druce, 1909 : 458. LECTOTYPE ♀, Colombia: W., San Antonio, 5800 ft, xi.1907 (*Palmer*) (BMNH), here designated [examined].
Automolis rosa Druce; Strand, 1919 : 23.
Automolis rosa Druce; Hampson, 1920 : 149, pl. 46, fig. 11.
Automolis rosa Druce; Seitz, 1921 : 370, pl. 51b. [Inaccurate; outer margin of forewing should be evenly and weakly convex, dark areas on forewing should be a pastel pink, and abdomen pinkish, not yellow.]

CTENUCHIDAE

The following nominal species are here transferred to existing Ctenuchid genera.

Aclytia apicalis (Walker) comb. n.

Euchromia apicalis Walker, 1854 : 261. Syntypes, 3 ♂, Brazil: Pará (*Bates*) (BMNH) [examined].
Apiconoma apicalis (Walker) Kirby, 1892 : 170.

Automolis apicalis (Walker) Hampson, 1901 : 46, fig. 41 (head, pattern, venation).
Automolis apicalis (Walker); Strand, 1919 : 14.
Automolis apicalis (Walker); Seitz, 1921 : 375. [No fig.]

Delphyre oviplaga (Rothschild) comb. n.

Automolis oviplaga Rothschild, 1933 : 171. Syntypes, 1 ♂, 1 ♀, Brazil: 'Alto da Sierra' and Sta Catarina (BMNH) [examined].

This species is placed here because of the current placement in *Delphyre* of apparently closely related species. The type-species of *Delphyre* is almost certainly not congeneric with *oviplaga*.

Teucer approximans (Rothschild) comb. n.

Automolis approximans Rothschild, 1922 : 475. Syntypes, 3 ♂, Peru: Rio Huacamayo, La Union, 2000 ft, xi.1904 (*Ockenden*) (BMNH) [examined].

Teucer fuliginosa (Rothschild) comb. n.

Automolis fuliginosa Rothschild, 1910*d* : 187, pl. 14, fig. 10. Holotype ♀, Brazil: Amazonas, Fonte Boa (*Klages*) (BMNH) [examined].
Automolis fuliginosa Rothschild; Strand, 1919 : 187.
Automolis fuliginosa Rothschild; Hampson, 1920 : 158.
Automolis fuliginosa Rothschild; Seitz, 1921: 372, pl. 51g [misleading fig., see Rothschild, 1910*d* : pl. 14].

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INDEX

Unavailable and invalid names are in *italics*.

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PLATE 1

FIG. 1. *Viviennea moma*, ♂, left tymbal organ (× 36).
FIG. 2. *V. moma*, ♂, base of microtymbal hair-scale (× 385).
FIG. 3. *V. moma*, ♂, ventral view of left hindwing showing scent-organ in anal fold (× 32).
FIG. 4. *V. moma*, ♂, 'petal' scales of scent-organ (× 134).
FIG. 5. *V. moma*, ♂, dorsal surface.
FIG. 6. *V. tegyra*, ♂, dorsal surface.


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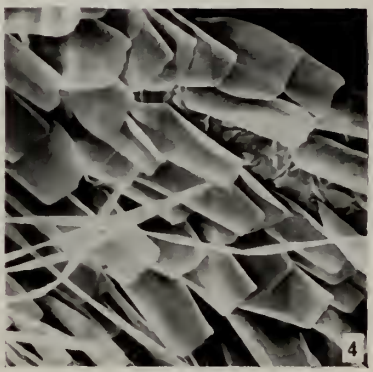
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PLATE 2

FIG. 7. *Viviennea moma*, ♂, genitalia.
FIG. 8. *V. moma*, ♂, aedeagus.
FIG. 9. *V. moma*, ♀, genitalia.
FIG. 10. *V. moma*, ♀, ostial region of genitalia.
FIG. 11. *V. tegyra*, ♂, genitalia.
FIG. 12. *V. tegyra*, ♂, aedeagus.


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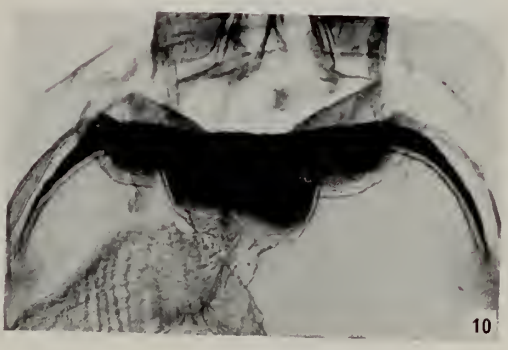
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PLATE 3

FIG. 13. *Viviennea salma*, ♂, dorsal surface (lectotype of *whitei*).
FIG. 14. *V. salma*, ♂, dorsal surface.
FIG. 15. *V. salma*, ♂, aedeagus.
FIG. 16. *V. salma*, ♂, genitalia.
FIG. 17. *V. superba*, ♂, genitalia.
FIG. 18. *V. superba*, ♂, aedeagus.
FIG. 19. *V. superba*, ♀, genitalia.
FIG. 20. *V. superba*, ♀, ostial region of genitalia.


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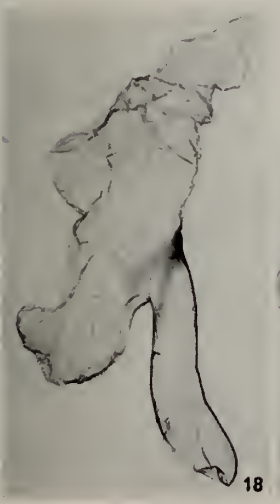
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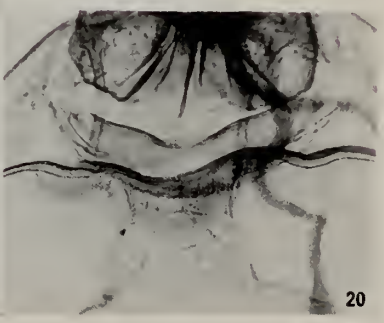
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PLATE 4

FIG. 21. *Viviennea euricosilvai*, ♂, dorsal surface.
FIG. 22. *V. euricosilvai*, ♂, genitalia.
FIG. 23. *V. euricosilvai*, ♂, aedeagus.
FIG. 24. *V. flavicincta*, ♂, dorsal surface.
FIG. 25. *V. flavicincta*, ♂, genitalia.
FIG. 26. *V. flavicincta*, ♂, aedeagus.


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PLATE 5

FIG. 27. *Viviennea flavicincta*, ♀, genitalia.
FIG. 28. *V. flavicincta*, ♀, ostial region of genitalia.
FIG. 29. *V. dolens*, ♂, dorsal surface.
FIG. 30. *V. dolens*, ♂, dorsal surface (lectotype of *immarginata*).
FIG. 31. *V. dolens*, ♂, dorsal surface.
FIG. 32. *V. dolens*, ♀, dorsal surface.

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PLATE 6

FIG. 33. *Viviennea zonana*, ♂, dorsal surface.
FIG. 34. *V. ardesiaca*, ♂, dorsal surface.
FIG. 35. *V. zonana*, ♂, genitalia.
FIG. 36. *V. zonana*, ♂, aedeagus.
FIG. 37. *V. ardesiaca*, ♀, genitalia.
FIG. 38. *V. ardesiaca*, ♂, genitalia.
FIG. 39. *V. ardesiaca*, ♂, aedeagus.
FIG. 40. *V. ardesiaca*, ♀, ostial area of genitalia.


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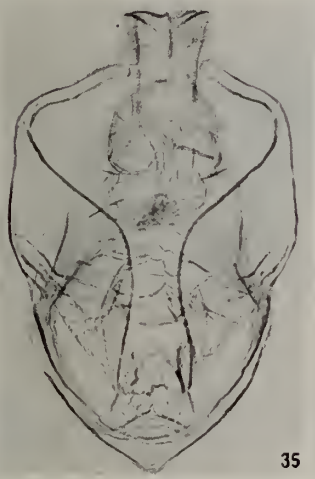
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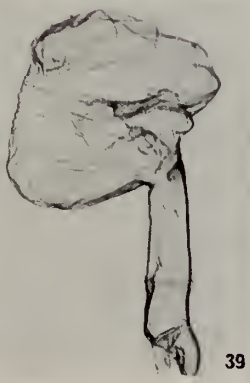
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PLATE 7

FIG. 41. *Viviennea ardesiaca*, ♂, dorsal surface.
FIG. 42. *V. ardesiaca*, ♂, dorsal surface.
FIG. 43. *V. griseonitens*, ♂, dorsal surface.
FIG. 44. *V. griseonitens*, ♀, ostial region of genitalia.
FIG. 45. *V. griseonitens*, ♂, genitalia (lectotype).
FIG. 46. *V. griseonitens*, ♂, aedeagus (lectotype).
FIG. 47. *V. griseonitens*, ♀, genitalia.


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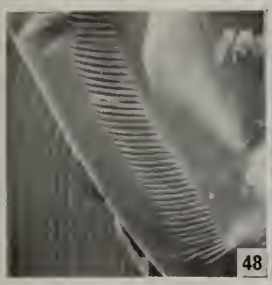
PLATE 8

FIG. 48. *Ordishia rutila*, ♂ left tymbal organ (× 68).
FIG. 49. *O. rutila*, ♂, microtymbals showing hair-scale sockets (× 170).
FIG. 50. *O. rutila*, ♂, aedeagus.
FIG. 51. *O. rutila*, ♀, dorsal surface.
FIG. 52. *O. rutila*, ♂, genitalia.
FIG. 53. *O. rutila*, ♀, genitalia.
FIG. 54. *O. rutila*, ♀, ostial region of genitalia.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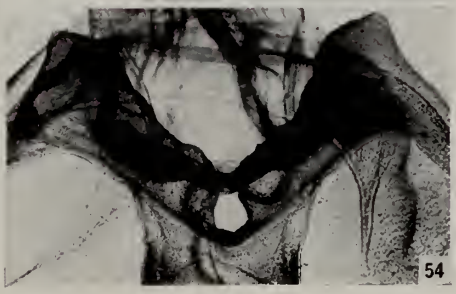
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PLATE 9

FIG. 55. *Ordishia godmani*, ♀, dorsal surface (lectotype).
FIG. 56. *O. godmani*, ♀, ostial region of genitalia (lectotype).
FIG. 57. *O. godmani*, ♀, genitalia (lectotype).
FIG. 58. *O. cingulata*, ♀, ostial region of genitalia (paralectotype).
FIG. 59. *O. cingulata*, ♀, dorsal surface (lectotype).
FIG. 60. *O. cingulata*, ♀, genitalia (paralectotype).

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PLATE 10

FIG. 61. *Ordishia klagesi*, ♂, aedeagus.
FIG. 62. *O. klagesi*, ♂, genitalia.
FIG. 63. *O. klagesi*, ♂, dorsal surface.
FIG. 64. *O. albofasciata*, ♂, genitalia.
FIG. 65. *O. albofasciata*, ♂, dorsal surface.
FIG. 66. *O. albofasciata*, ♂, aedeagus.

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PLATE 11

FIG. 67. *Melanarctia ockendeni*, ♂, dorsal surface (paralectotype).
FIG. 68. *M. ockendeni*, ♂, aedeagus (paralectotype).
FIG. 69. *M. ockendeni*, ♂, genitalia (paralectotype).
FIG. 70. *M. lativitta*, ♂, genitalia (paralectotype).
FIG. 71. *M. lativitta*, ♂, dorsal surface (paralectotype).
FIG. 72. *M. lativitta*, ♂, aedeagus (paralectotype).


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PLATE 12

FIG. 73. *Melanarctia lativitta*, ♂, proximal part of androconial patch on upper surface of left hindwing (× 140).

FIG. 74. *M. lativitta*, ♂, enlargement of androconial scales shown in fig. 73 (× 282).

FIG. 75. *M. lativitta*, ♂, surface structure of androconial scales (× 1409).

FIG. 76. *M. lativitta*, ♂, ventral view of left hindwing showing scent organ in anal fold (× 36).

FIG. 77. *M. lativitta*, ♂, enlargement of overlapping 'petal' scales shown in fig. 76 (× 151).


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PLATE 13

FIG. 78. *Himerarctia docis*, ♂, left tymbal organ (× 21).
FIG. 79. *H. docis*, ♂, view along microtymbals showing hair-scale sockets (× 192).
FIG. 80. *H. docis*, ♂, ventral view of left hindwing showing scent organ in anal fold (× 32).
FIG. 81. *H. docis*, ♂, enlargement of overlapping 'petal' scales shown to right of centre in fig. 80 (× 229).
FIG. 82. *H. docis*, ♂, enlargement of overlapping scales shown to the left of centre in fig. 80 (× 308).
FIG. 83. *H. docis*, ♂, surface structure of scales shown in fig. 82 (× 3502).


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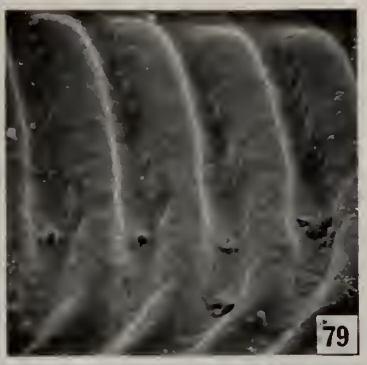
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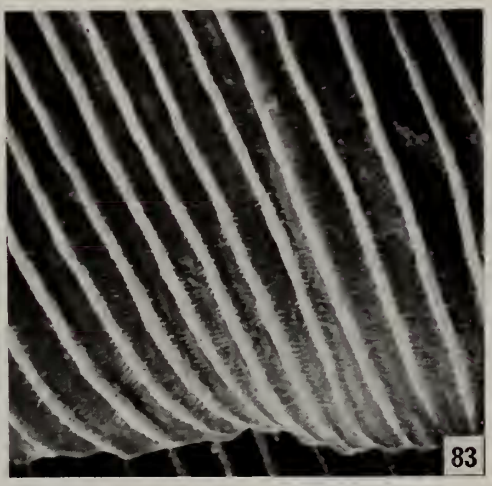
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PLATE 14

FIG. 84. *Himerarctia docis*, ♂, dorsal surface.
FIG. 85. *H. docis*, ♂, aedeagus.
FIG. 86. *H. docis*, ♀, genitalia.
FIG. 87. *H. docis*, ♀, ostial region of genitalia.
FIG. 88. *H. docis*, ♂, genitalia.

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PLATE 15

FIG. 89. *Himerarctia viridisignata*, ♀, dorsal surface (paratype).
FIG. 90. *H. viridisignata*, ♂, genitalia (holotype).
FIG. 91. *H. viridisignata*, ♀, genitalia (paratype).
FIG. 92. *H. viridisignata*, ♀, ostial region of genitalia (holotype).
FIG. 93. *H. viridisignata*, ♂, aedeagus (paratype).

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PLATE 16

FIG. 94. *Himerarctia laeta*, ♂, dorsal surface (paratype).
FIG. 95. *H. laeta*, ♂, genitalia (holotype).
FIG. 96. *H. laeta*, ♀, genitalia (paratype).
FIG. 97. *H. laeta*, ♀, ostial region of genitalia (paratype).
FIG. 98. *H. laeta*, ♂, aedeagus (holotype).

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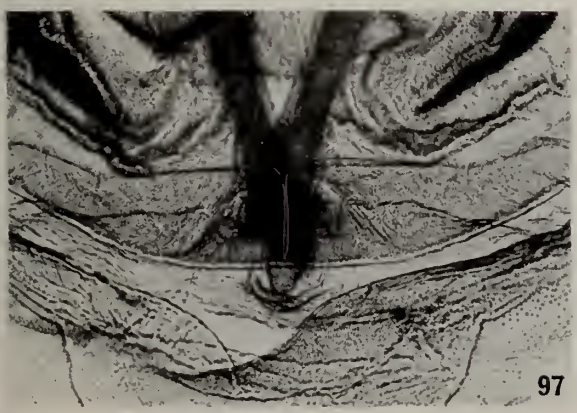

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PLATE 17

FIG. 99. *Himerarctia griseipennis*, ♂, dorsal surface (lectotype).
FIG. 100. *H. griseipennis*, ♂, genitalia, inner surface of right valve.
FIG. 101. *H. griseipennis*, ♀, dorsal surface.
FIG. 102. *H. griseipennis*, ♂, genitalia, right valve removed.
FIG. 103. *H. griseipennis*, ♀, genitalia.
FIG. 104. *H. griseipennis*, ♀, ostial region of genitalia.
FIG. 105. *H. griseipennis*, ♂, aedeagus.


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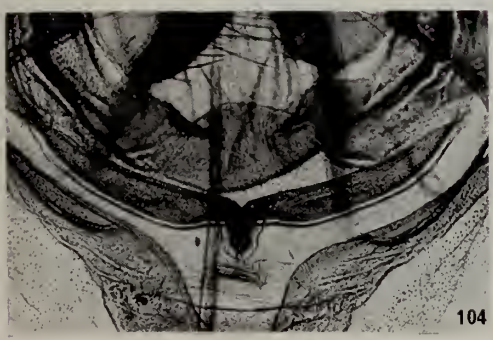
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PLATE 18

FIG. 106. *Amphelarctia priscilla*, ♂, dorsal surface.
FIG. 107. *A. priscilla*, ♀, genitalia.
FIG. 108. *A. priscilla*, ♀, ostial region of genitalia.
FIG. 109. *A. priscilla*, ♂, aedeagus.
FIG. 110. *A. priscilla*, ♂, genitalia.

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PLATE 19

FIG. 111. *Selenarctia elissa*, ♂, left tymbal organ (× 17).
FIG. 112. *S. elissa*, ♂, central part of left tymbal showing microtymbals, hair-scale sockets, and three hair-scales (× 104).
FIG. 113. *S. elissa*, ♂, base of microtymbal hair-scale (× 1701).
FIG. 114. *S. elissa*, ♂, dorsal surface.
FIG. 115. *S. elissa*, ♂, aedeagus.
FIG. 116. *S. elissa*, ♀, genitalia.
FIG. 117. *S. elissa*, ♂, genitalia.


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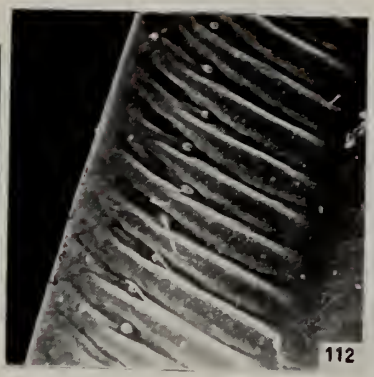
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PLATE 20

FIG. 118. *Selenarctia elissoides*, ♀, genitalia (paralectotype).
FIG. 119. *S. elissoides*, ♀, ostial region of genitalia (paralectotype).
FIG. 120. *S. elissoides*, ♂, genitalia.
FIG. 121. *S. elissoides*, ♂, aedeagus.
FIG. 122. *S. flavidorsata*, ♂, genitalia.
FIG. 123. *S. flavidorsata*, ♂, aedeagus.

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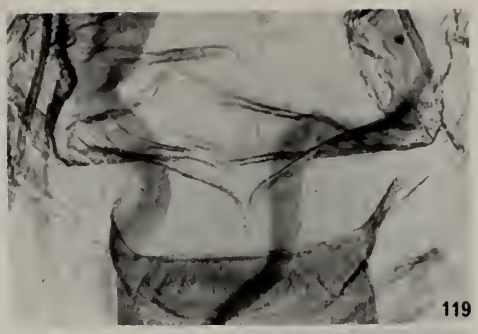

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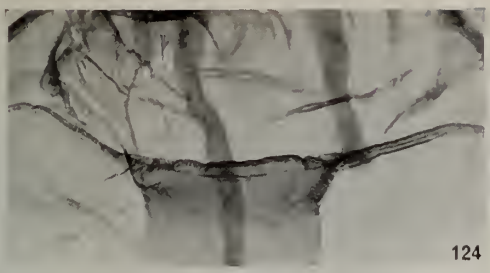
PLATE 21

FIG. 124. *Selenarctia flavidorsata*, ♀, ostial region of genitalia.
FIG. 125. *S. flavidorsata*, ♂, dorsal surface (holotype).
FIG. 126. *S. flavidorsata*, ♀, genitalia.
FIG. 127. *S. pseudelissa*, ♂, dorsal surface.
FIG. 128. *S. pseudelissa*, ♀, ostial region of genitalia.
FIG. 129. *S. pseudelissa*, ♀, genitalia.
FIG. 130. *S. pseudelissa*, ♂, genitalia.
FIG. 131. *S. pseudelissa*, ♂, aedeagus.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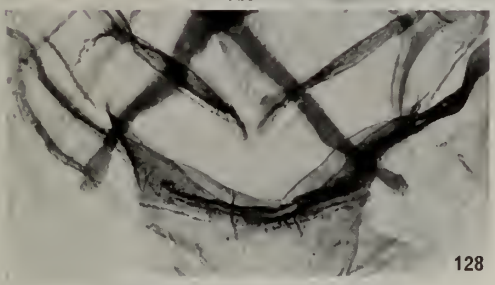
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PLATE 22

FIG. 132. *Selenarctia schausi*, ♂, dorsal surface.
FIG. 133. *S. schausi*, ♀, genitalia.
FIG. 134. *S. schausi*, ♀, ostial region of genitalia.
FIG. 135. *S. schausi*, ♂, aedeagus.
FIG. 136. *S. schausi*, ♂, genitalia.

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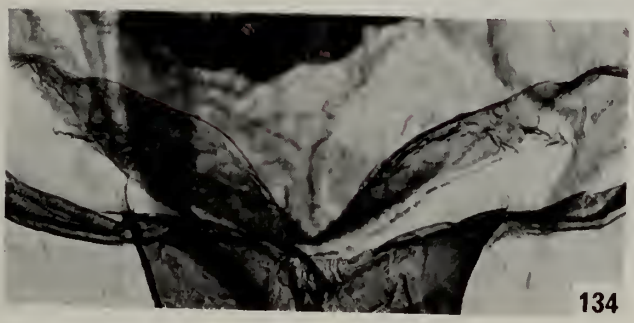

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PLATE 23

FIG. 137. *Aphyarctia surinamensis*, ♂, dorsal surface.
FIG. 138. *A. surinamensis*, ♂, genitalia.
FIG. 139. *A. surinamensis*, ♂, aedeagus.
FIG. 140. *A. surinamensis*, ♀, ostial region of genitalia.
FIG. 141. *A. surinamensis*, ♀, genitalia.

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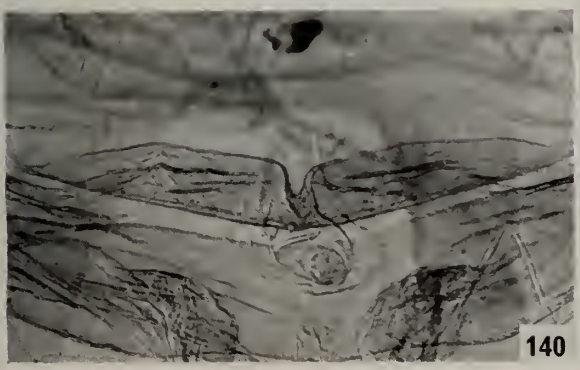

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PLATE 24

FIG. 142. *Emurena lurida*, ♂, dorsal surface.
FIG. 143. *E. fernandezi*, ♂, dorsal surface (paratype).
FIG. 144. *E. lurida*, ♂, genitalia.
FIG. 145. *E. fernandezi*, ♂, genitalia (paratype).
FIG. 146. *E. lurida*, ♂, aedeagus (lectotype).
FIG. 147. *E. fernandezi*, ♂, aedeagus (paratype).

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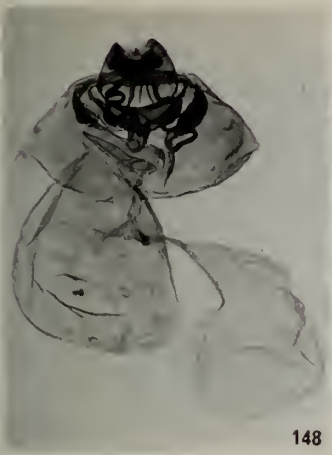
PLATE 25

FIG. 148. *Emurena fernandezi*, ♀, genitalia.
FIG. 149. *E. fernandezi*, ♀, ostial region of genitalia.
FIG. 150. *E. fernandezi*, ♂, left tymbal organ (× 20).
FIG. 151. *E. fernandezi*, ♂, ventral view of anal fold scent-organ of right hindwing (× 17).
FIG. 152. *E. fernandezi*, ♂, ventro-lateral view of anal fold scent-organ showing 'petal' scales overlaid by hair-scales (× 42).
FIG. 153. *E. fernandezi*, ♂, enlargement of 'petal' scales shown in top-left of fig. 151 (× 90).
FIG. 154. *E. fernandezi*, ♂, showing ridged 'upper' surface and nearly smooth 'under' surface of 'petal' scales (× 1313).
FIG. 155. *E. fernandezi*, ♂, part of typical hair-scale of anal fold scent-organ showing porous surface structure (× 3657).
FIG. 156. *E. fernandezi*, ♂, lanceolate scales of androconial patch on overlap area of right hindwing (× 78).
FIG. 157. *E. fernandezi*, ♂, enlargement of scales shown in fig. 156 (× 388).



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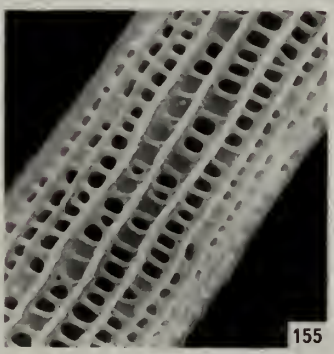

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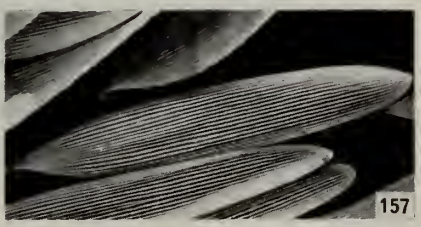

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PLATE 26

FIG. 158. *Emurena tripunctata*, ♂ ventral view of scent-organ in anal fold of left hindwing (× 36). There are two elongate patches of androconia (apposed in the normal position) separated by a hair-pencil.

FIG. 159. *E. tripunctata*, ♂, androconial scales from longer of two patches in fig. 158 (× 140).

FIG. 160. *E. tripunctata*, ♂, androconial scales from shorter of two patches in fig. 158 (× 140).

FIG. 161. *E. tripunctata*, ♂, surface structure of two hair-pencil scales (× 3509).

FIG. 162. *E. tripunctata*, ♂, surface structure of scales shown in fig. 160 (× 3509).


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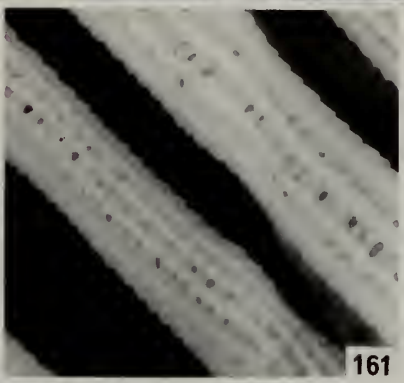
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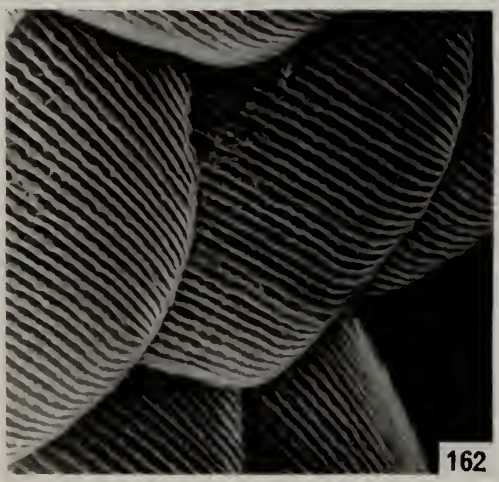
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PLATE 27

FIG. 163. *Emurena tripunctata*, ♂, dorsal surface.
FIG. 164. *E. tripunctata*, ♀, genitalia.
FIG. 165. *E. tripunctata*, ♂, aedeagus.
FIG. 166. *E. tripunctata*, ♀, ostial region of genitalia.
FIG. 167. *E. tripunctata*, ♂, genitalia.

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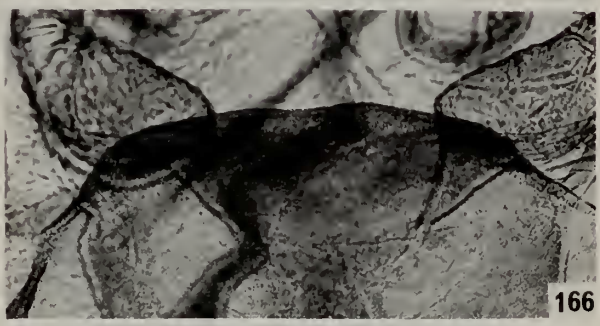

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PLATE 28

FIG. 168. *Emurena quinquepunctata*, ♂, dorsal surface (lectotype).
FIG. 169. *E. quinquepunctata*, ♂, dorsal surface (ex. in USNM).
FIG. 170. *E. quinquepunctata*, ♂, aedeagus (ex. in USNM).
FIG. 171. *E. quinquepunctata*, ♂, genitalia.
FIG. 172. *E. luridoides*, ♂, dorsal surface.
FIG. 173. *E. luridoides*, ♀, ostial region of genitalia.
FIG. 174. *E. luridoides*, ♂, aedeagus.
FIG. 175. *E. luridoides*, ♂, genitalia.
FIG. 176. *E. luridoides*, ♀, genitalia.


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PLATE 29

FIG. 177. *Regobarrosia flavescens*, ♂, dorsal surface.
FIG. 178. *R. flavescens*, ♂, dorsal surface.
FIG. 179. *R. flavescens*, ♂, genitalia.
FIG. 180. *R. flavescens*, ♂, aedeagus.
FIG. 181. *R. flavescens*, ♀, genitalia.
FIG. 182. *R. flavescens*, ♀, ostial region of genitalia.

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PLATE 30

FIG. 183. *Regobarrosia flavescens*, ♂, left tymbal organ (× 36).
FIG. 184. *R. flavescens*, ♂, antero-lateral view along microtymbals (× 229).
FIG. 185. *R. flavescens*, ♂, scales from area posterior to microtymbals (× 702).
FIG. 186. *R. flavescens*, ♂, upper surface of left hindwing showing large androconial area in cell (× 14).
FIG. 187. *R. flavescens*, ♂, androconial scales from area shown in fig. 186 (× 702).


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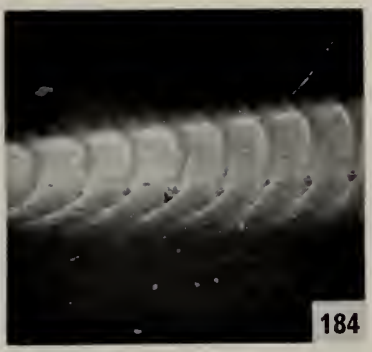
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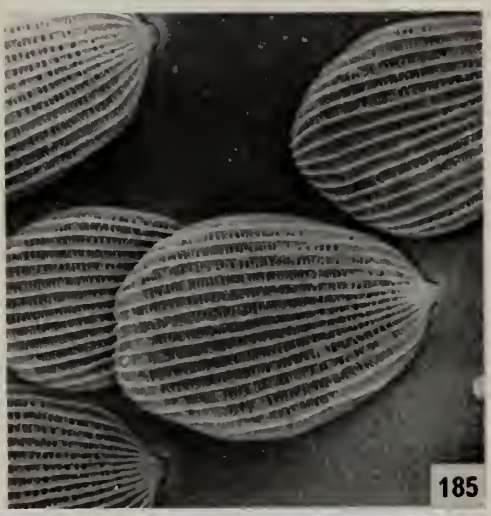
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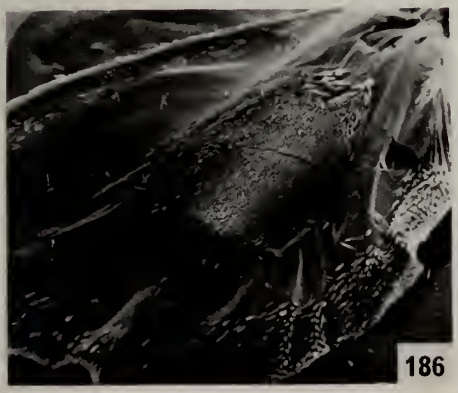
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PLATE 31

FIG. 188. *Regobarrosia pseudoflavescens*, ♂, dorsal surface.
FIG. 189. *R. aureogrisea*, ♂, dorsal surface.
FIG. 190. *R. pseudoflavescens*, ♂, genitalia (holotype).
FIG. 191. *R. aureogrisea*, ♂, genitalia.
FIG. 192. *R. pseudoflavescens*, ♂, aedeagus (holotype).
FIG. 193. *R. aureogrisea*, ♂, aedeagus.

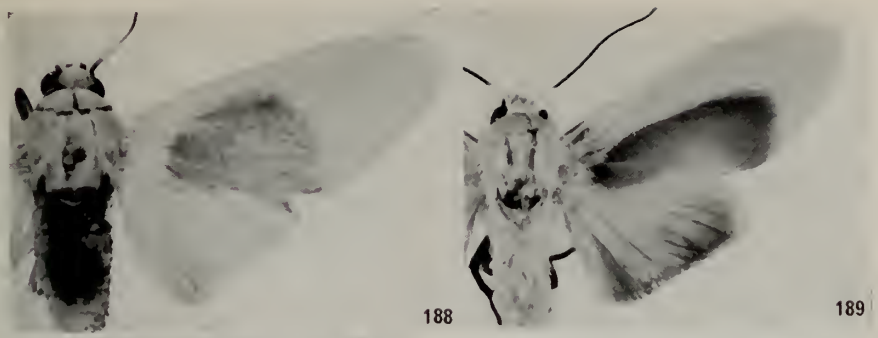
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PLATE 32

FIG. 194. *Astralarctia pulverosa*, ♂, dorsal surface.
FIG. 195. *A. pulverosa*, ♂, left tymbal organ (× 36).
FIG. 196. *A. pulverosa*, ♂, dorso-lateral view of microtymbals (× 160). A single hair-scale remains.
FIG. 197. *A. pulverosa*, ♂, upper surface of left hindwing showing androconial area (× 11).
FIG. 198. *A. pulverosa*, ♂, ventral surface of left forewing showing scent-brush (× 35).
FIG. 199. *A. pulverosa*, ♂, part of a hair-scale from the scent-brush shown in fig. 198 (× 3859).

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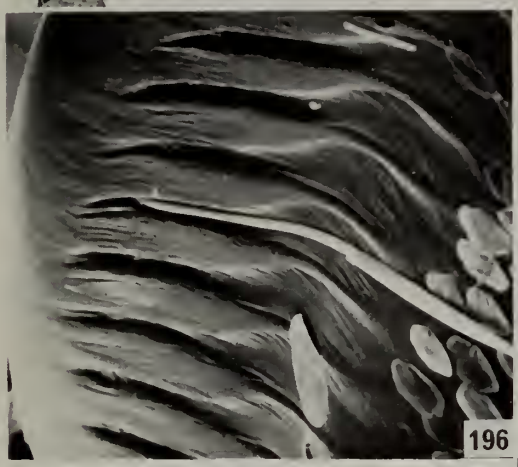

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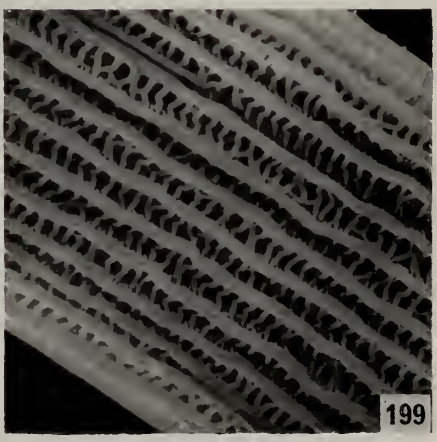

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PLATE 33

FIG. 200. *Astralarctia pulverosa*, ♂, aedeagus.
FIG. 201. *A. pulverosa*, ♂, genitalia.
FIG. 202. *Nyearctia leucoptera*, ♂, base of a microtymbal hair-scale (× 1123).
FIG. 203. *N. leucoptera*, ♂, left tymbal organ (× 24).
FIG. 204. *N. leucoptera*, ♂, anterolateral view along microtymbals showing proximal part of three hair-scales (× 349).

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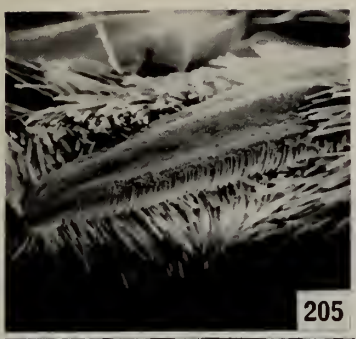
PLATE 34

FIG. 205. *Nyearctia leucoptera*, ♂, inner surface of right fore-tibia showing epiphysis (× 34).
FIG. 206. *N. leucoptera*, ♂, part of comb which borders front edge of epiphysis (× 135).
FIG. 207. *N. leucoptera*, ♂, spines from central part of epiphysis (× 419). The presence of detritus between the spines of the epiphysis lends support to the hypothesis that it functions as an antenna-cleaning organ.
FIG. 208. *Glaucostola flavida*, ♂, part of left tymbal organ showing irregular shape of microtymbals (× 109).
FIG. 209. *G. flavida*, ♂, left tymbal organ (× 34).
FIG. 210. *Echeta divisa*, ♂, left tymbal organ (× 16).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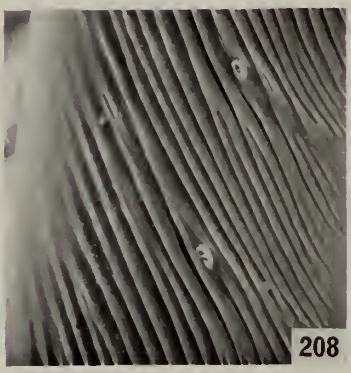
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